

Assessing the Relative Importance of Product and Packaging Attributes on Purchase Intent for E-cigarettes

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Introduction

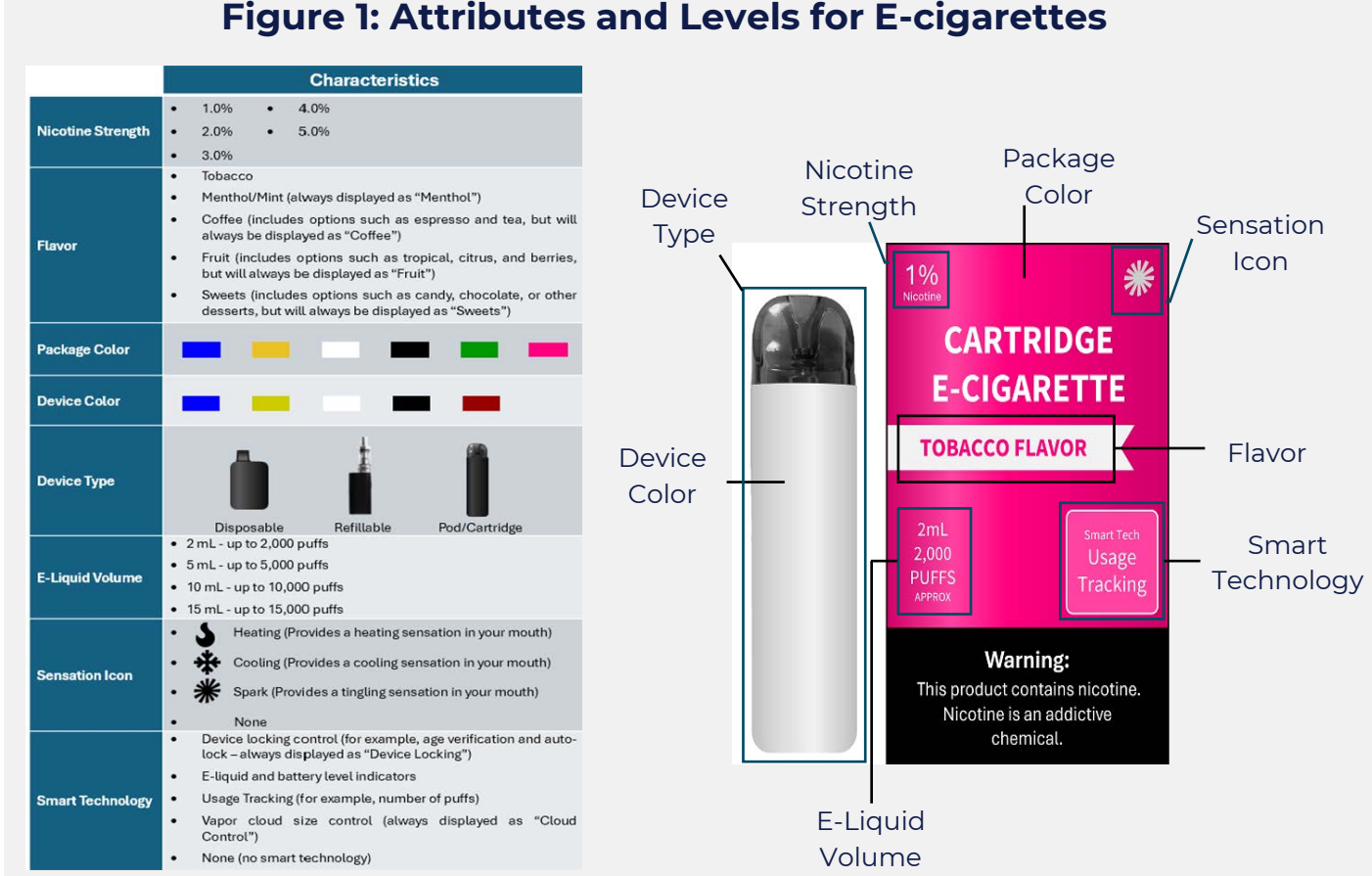
Understanding how different product features appeal to various consumer groups is essential for evaluating the public health impact of new tobacco or nicotine products. In the context of e-cigarettes, it is particularly important to distinguish between current cigarette smokers and nonusers of tobacco. This distinction helps inform the FDA's assessment, which requires that the benefits of a new product to current users (e.g. switching to a less harmful tobacco product) must outweigh the potential risks of initiation among nonusers. Therefore, evidence demonstrating that certain features, such as flavors, are more critical to smokers seeking alternatives than they are appealing to nonusers is fundamental to assessing the impact on population health. Several published studies have investigated the relative importance of product features, but they have focused primarily on current cigarette smokers and/or e-cigarette users and not directly compared the importance of product attributes across groups of respondents.^{1,2,3,4,5} This research addressed the relative importance of 8 e-cigarette or e-cigarette packaging attributes separately for each of three groups of respondents – current established cigarette smokers, former established tobacco users, and never tobacco users.

Methodology

Figure 1 lists the characteristics that were varied and a sample product displayed to respondents. Estimating attribute importance across the 180,000 possible product combinations required developing a conjoint design in which respondents provided a purchase intent rating on a 10-point scale for each of a systematic subset of 12 fictitious e-cigarettes. Those data were then used to estimate Hierarchical Bayesian Tobit models with individual-specific slopes and intercepts, with conjoint attribute levels as predictors separately for each tobacco user group. Individual-level coefficients were estimated for each level of each attribute. Those coefficients were then used to calculate Attribute Importance Points (AIPs) for each respondent.

4,585 U.S. adults ages 21–64 (1,236 current established cigarette smokers, 1,587 former established tobacco users, and 1,762 never tobacco users) were recruited from EMI Research Solutions to participate in a 15-minute survey. To ensure enough respondents in each tobacco user group had sufficient interest in the products to provide variability in their ratings across the 12 products (which is required to build the models), sampling occurred in two phases. In the first phase, 1,000 respondents were recruited without regard to interest in e-cigarettes. Respondents recruited in the second phase were required to have some interest in e-cigarettes. Respondents were sampled roughly proportionally on three demographic variables (sex, age, and race/ethnicity) within each tobacco user group and weighted up to population counts from the Annual Social and Economic Tobacco Use Supplement to the Current Population Survey (ASEC-CPS) and the Tobacco Use Supplement to the Current Population Survey (TUS-CPS) on those dimensions.

Stimuli

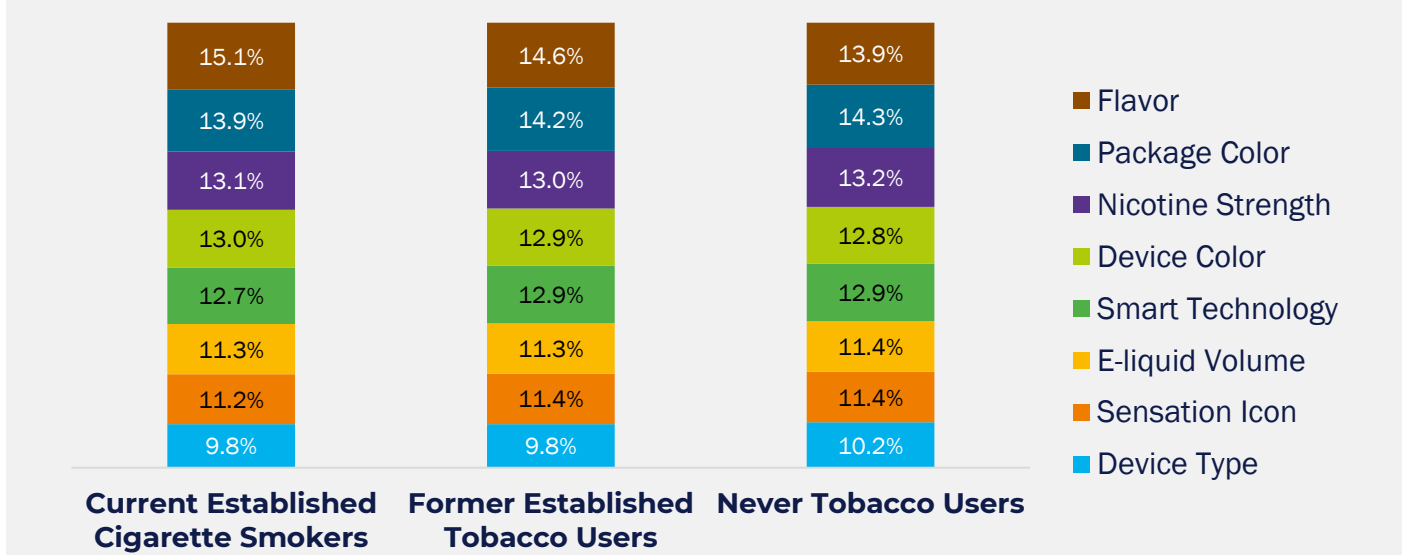


Results

Figure 2 presents the weighted mean AIPs for each tobacco user group and makes three main points:

- Flavor and package color are the two most important attributes for all three tobacco user groups
- Device type is the least important attribute for all three tobacco user groups.
- The order of attribute importance is broadly similar for all three tobacco user groups.

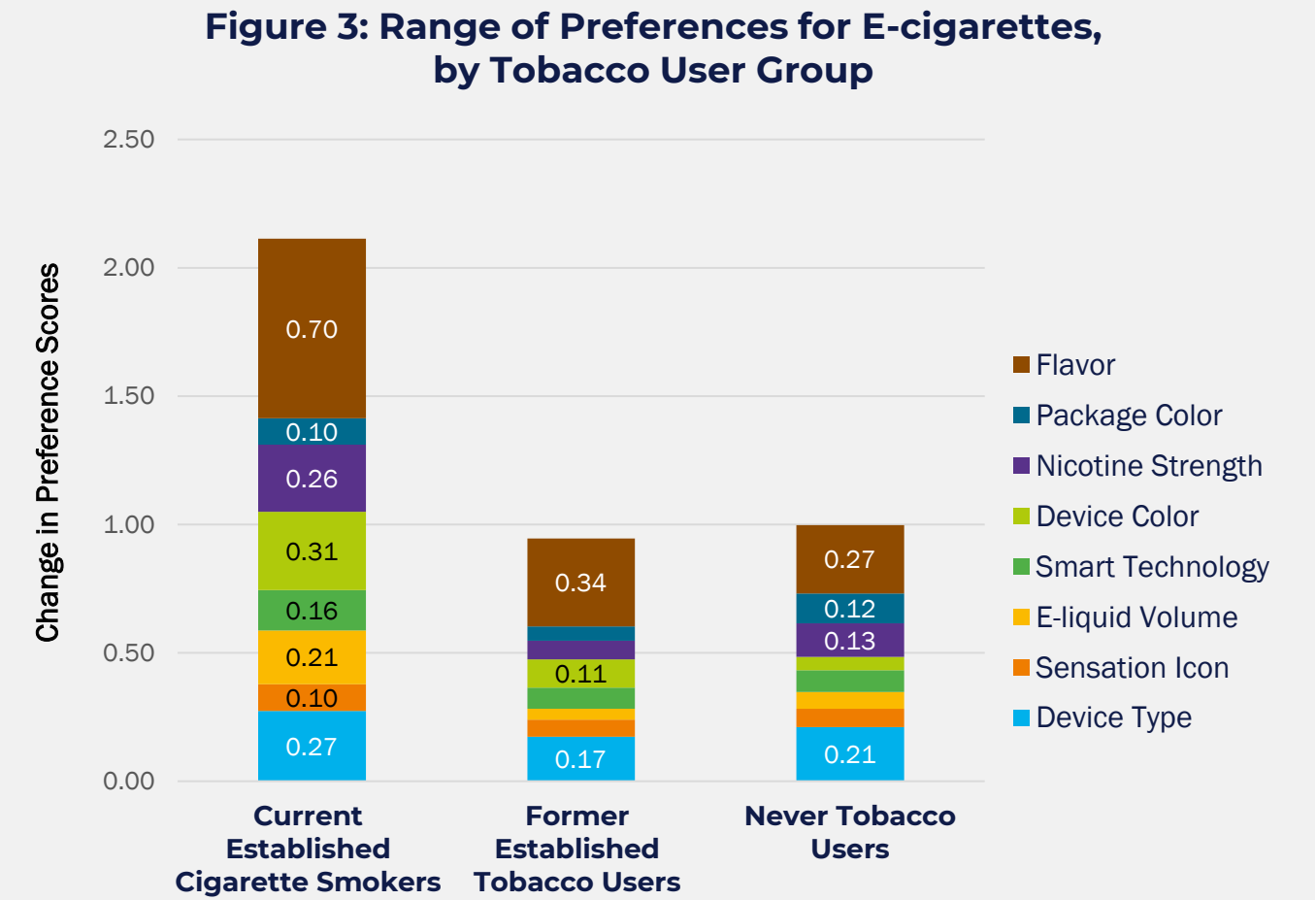
Figure 2: Mean Attribute Importance Points, by Tobacco User Group



References

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AIPs provide *relative* importance of attributes. Preference scores, by contrast, estimate an absolute rating for each level of each attribute on the original 10-point scale. **Figure 3** presents the change in preference scores from the highest rated level and lowest rated level of each attribute by tobacco user group. The total change across attributes is far greater for current established smokers (2.1) than former established tobacco users (0.9) and never tobacco users (1.0).



Conclusion

These findings suggest that the relative importance of these 8 attributes are similar across the three tobacco user groups. As a result, there is no evidence that any of the attributes would appeal more to nonusers of tobacco than to current established cigarette smokers. Notably, when preference scores are considered, the impact of changing the levels of the attributes among current established cigarette smokers is over 2x larger than among former established tobacco users and never tobacco users. While flavor is the biggest driver in change in purchase intent for all three groups, the impact is more than twice as large for current established cigarette smokers than for the two groups of tobacco nonusers. These data, therefore, suggest e-cigarette flavors can contribute to use, and potentially switching, among current established smokers with relatively lower risk of attracting nonusers of tobacco.