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## Background

- Tobacco product packaging elements are used to manipulate consumers' product perceptions
- Effect of cigarette package design is well-documented, but research on non-cigarette packaging, particularly cigars, is lacking
- Qualitative evidence suggests flavors are primary appeal of little cigar/cigarillos (LCCs) and cues from flavor descriptors on packs influence affect toward and use of LCCs
- This study investigated how flavor descriptors, colors, type, branding, and warnings on cigarillo packs influence perceptions of flavor, taste, smell, and appeal among young adults

## Methods

- Participants recruited through **Amazon Mechanical Turk (n=2,664)**
- Eligibility:**
  - 18-26 years old
  - U.S. residence
  - Current, ever, or never use of LCCs
- Cigarillo packs manipulated on 5 elements:**
  - Flavor descriptor (none, Sweet, Grape, Wine, Tropical)
  - Color (no color, pink, purple)
  - Type (box 5-pack, foil 2-pack)
  - Branding (no branding, branded)
  - Warning (no warning, text-only, pictorial)
- Participants **viewed 3 randomly selected cigarillo packs**
- Survey measures **assessed product appeal and perceptions of flavor, taste, and smell**
- Linear mixed-effects models** to estimate effect of pack elements on product perceptions



## Results

**Table 1. Mixed-effects model results, main effects only**

Independent variables	Flavor β (SE)	Taste β (SE)	Smell β (SE)	Appeal β (SE)
<b>Flavor descriptor</b>				
None	Ref	Ref	Ref	Ref
Flavor descriptor	<b>0.35 (0.03)<sup>c</sup></b>	<b>0.20 (0.03)<sup>c</sup></b>	<b>0.14 (0.03)<sup>c</sup></b>	0.05 (0.04)
<b>Color</b>				
No color	Ref	Ref	Ref	Ref
Pink or purple	<b>0.11 (0.03)<sup>c</sup></b>	<b>0.17 (0.03)<sup>c</sup></b>	<b>0.15 (0.03)<sup>c</sup></b>	<b>0.14 (0.04)<sup>c</sup></b>
<b>Type</b>				
Box 5-pack	Ref	Ref	Ref	Ref
Foil 2-pack	0.04 (0.03)	-0.02 (0.03)	0.001 (0.03)	<b>0.17 (0.03)<sup>c</sup></b>
<b>Branding</b>				
No branding	Ref	Ref	Ref	Ref
Branded	0.01 (0.03)	-0.01 (0.03)	0.003 (0.03)	0.01 (0.03)
<b>Warning</b>				
No warning	Ref	Ref	Ref	Ref
Text-only	-0.04 (0.03)	-0.05 (0.03)	<b>-0.07 (0.03)<sup>a</sup></b>	-0.01 (0.04)
Pictorial	-0.01 (0.03)	<b>-0.06 (0.03)<sup>a</sup></b>	<b>-0.08 (0.03)<sup>a</sup></b>	0.01 (0.04)
<b>LCC use</b>				
Never	Ref	Ref	Ref	Ref
Ever	<b>0.15 (0.04)<sup>c</sup></b>	0.08 (0.04)	<b>0.18 (0.05)<sup>c</sup></b>	0.05 (0.06)
Current	<b>0.09 (0.04)<sup>a</sup></b>	0.01 (0.05)	0.11 (0.06)	<b>0.17 (0.08)<sup>a</sup></b>

\*Models adjusted for age, race, ethnicity, sexual orientation, education, and pre-existing perceptions of LCCs  
<sup>a</sup>p<.05; <sup>b</sup>p<.01; <sup>c</sup>p<.001

### Main Findings from Table 1

#### Flavor descriptor

- Packs with any flavor descriptor more likely to be perceived as containing a flavor, and rated more favorably on taste and smell (compared to packs with no flavor descriptor)

#### Color

- Pink or purple packs more likely to be perceived as containing a flavor, and rated more favorably on taste, smell, and appeal (compared to non-colored packs)

#### Type

- Foil 2-packs rated more appealing than box 5-packs

#### Branding

- No significant effects

#### Warning

- Packs with pictorial warning perceived as having less favorable taste, and packs with text-only or pictorial warnings perceived as having a less favorable smell (compared to packs with no warning)

#### LCC use

- Ever and current LCC users more likely to perceive packs as containing a flavor; ever users rated smell more favorably; and current users rated packs more appealing (compared to never LCC users)

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**Table 2. Mixed-effects model results including interaction effects (main effects not shown)**

Independent variables	Flavor β (SE)	Taste β (SE)	Smell β (SE)	Appeal β (SE)
<b>LCC use x Flavor descriptor</b>				
Current user x Flavor descriptor	<b>-0.20 (0.08)<sup>b</sup></b>	<b>-0.23 (0.08)<sup>b</sup></b>	-0.15 (0.08)	0.16 (0.10)
Ever user x Flavor descriptor	-0.04 (0.08)	-0.15 (0.08)	-0.05 (0.08)	0.01 (0.11)
<b>LCC use x Color</b>				
Current user x Pink or purple pack	0.03 (0.06)	0.06 (0.07)	0.08 (0.07)	0.09 (0.09)
Ever user x Pink or purple pack	-0.08 (0.07)	0.03 (0.07)	-0.01 (0.07)	-0.08 (0.09)
<b>Warning x Flavor descriptor</b>				
Text x Flavor descriptor	0.09 (0.08)	0.12 (0.08)	0.11 (0.08)	0.07 (0.11)
Graphic x Flavor descriptor	-0.03 (0.08)	0.09 (0.08)	-0.01 (0.08)	-0.01 (0.11)
<b>Warning x Color</b>				
Text x Pink or purple pack	0.02 (0.07)	-0.03 (0.07)	-0.07 (0.07)	-0.002 (0.09)
Graphic x Pink or purple pack	0.01 (0.07)	-0.08 (0.07)	-0.11 (0.07)	0.09 (0.09)

\*Models adjusted for age, race, ethnicity, sexual orientation, education, and pre-existing perceptions of LCCs  
<sup>a</sup>p<.05; <sup>b</sup>p<.01; <sup>c</sup>p<.001

### Main Findings from Table 2

#### LCC use X Flavor descriptor

- Significant interaction for predicting flavor and taste outcomes → Flavor descriptors had a greater impact on never users' perceptions of flavor and taste

#### LCC use x Color

- No significant interactions

#### Warning x Flavor descriptor

- No significant interactions

#### Warning x Color

- No significant interactions



## Conclusions

- First experimental evidence demonstrating that cigarillo packaging influences perceptions of cigarillos among young adult LCC users and non-users
- Pack flavor descriptors and colors significantly influenced product perceptions; this effect was especially pronounced among never LCC users compared to current users
- Pack warnings decreased favorable perceptions of taste and smell, but did not moderate effects of flavor descriptor or color
- In addition to a flavor ban, enacting stricter packaging regulations on cigarillos and other cigars (e.g., restrictions on flavor cues and colors) could generate more negative responses toward the products and lower use