

# Exploring Young People’s Beliefs about Menthol Cigarettes

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## Objective

Our aim is to explore young people’s beliefs and knowledge about the differences between menthol and non-menthol cigarettes, in order to guide the FDA’s thinking about potential strategies to reduce initiation of menthol use among young people. In our previous report regarding menthol cigarettes (dated April 23<sup>rd</sup>, 2013) we explored the association between beliefs about menthol cigarettes and having no intention to smoke menthol cigarettes. In this report, we report the findings from additional analyses which examine both the association between holding anti-menthol beliefs and having no intention to use tobacco in general, and whether the associations between anti-menthol beliefs and intentions are the same for younger (13 – 15 year old) and older (16 – 17 year old) respondents.

## Data Collection Process

In the main survey—which was developed to identify potential target beliefs for a smoking prevention mass media campaign—we included several questions assessing young people’s awareness of, intentions to use, perceived use among peers, and beliefs about menthol cigarettes.

## Results: SSI & GfK Surveys with 13 – 17 Year Olds

### 1. Methods

#### 1.1. Sample

Data for this study were collected from two sources: Survey Sampling International (SSI;  $n = 806$ ) and GfK (formerly known as Knowledge Networks;  $n = 396$ ). Data from the two original

samples were combined into a composite sample, which was then weighted to be representative of the US population of 13 – 17 year olds in terms of sex, age, race/ethnicity, and the proportion of the sample living in metro and non-metro areas. Smoking status (non-smoker or smoker) was defined using a measure of intentions to smoke within the next 30 days (non-smoker = not intending to smoke within the next 30 days), as we were unable to measure actual smoking behavior in the SSI sample. For the current analyses, we excluded the respondents who were intending to smoke within the next 30 days (whom we assumed to be current smokers), leaving us with an eligible sample of 1134 respondents whom we believed to be **current non-smokers**. For the main analyses, we also limited the sample to those respondents who indicated that they had previously heard of menthol cigarettes. When asked “Have you ever heard of menthol cigarettes? (yes/no)”, just under half of the current non-smokers reported that they had (48.8%). All subsequent menthol-related questions were asked only of these respondents, providing us with a final sample of 553 eligible respondents. Additional information about the recruitment methods and the sample can be found in the main report submitted to the FDA on April 23<sup>rd</sup> 2013 (“Identifying potential target beliefs for a youth-focused smoking prevention mass media campaign: Final findings and recommendations for 13 – 17 year old non-smokers”).

## **1.2. Procedure**

Data were collected using an online survey that took respondents around 12 minutes to complete.

## **1.3. Measures**

### **1.3.1. Intentions to Use Tobacco/Intentions to Smoke Menthol Cigarettes**

#### *Intentions to Use Tobacco*

Respondents were asked a series of sequential questions measuring their intentions to smoke, and their intentions to smoke menthol cigarettes. First, using 5-point scales (*very unlikely; unlikely; neither likely nor unlikely; likely; very likely*), respondents were sequentially asked about their intentions to be smoking **every day** one year from now; to be smoking, **but not every day**, one year from now; and to smoke **even one or two puffs** over the next year (i.e., only those participants who were *very unlikely, unlikely, or neither likely nor unlikely* to be “smoking every day” were asked the next question about their intentions to be “smoking, but not every day”, and so on). All respondents were also asked about their intentions to use other forms of tobacco over

the next year. Using the same *very unlikely* – *very likely* scale, respondents reported the likelihood that they would “be smoking any form of tobacco, other than cigarettes (e.g., cigars, water pipe, cigarillos, little cigars, pipe) **one year from now**” as well as the likelihood that they would “be using any form of smokeless tobacco (e.g., chewing tobacco, snuff, dip) **one year from now**”. Because very few respondents had *any* intention to use tobacco over the next year, we created a composite measure of **no intention to use tobacco**, which grouped together those participants who responded *very unlikely* to all intention questions (and compared them to all others).

#### *Intentions to Smoke Menthol Cigarettes*

Respondents who had indicated that they had heard of menthol cigarettes and who reported that they were *likely* or *very likely* to be smoking every day one year from now, were asked “How likely is it that you will be smoking menthol cigarettes **every day** one year from now?” A similar procedure was followed to measure intentions to be smoking menthol cigarettes, but not every day, and to smoke even one or two puffs of a menthol cigarette over the next year. A composite measure of **no intention to smoke menthol cigarettes** was created using the same approach as described above.

#### **1.3.2. Perceived Use of Menthol Cigarettes among Peers**

Respondents who indicated that they had heard of menthol cigarettes were asked “How many others your age smoke menthol cigarettes at all?” (*none; a few; some; most; all*).

#### **1.3.3. Beliefs about Menthol Cigarettes**

Seven questions measured beliefs about the relative characteristics of menthol and non-menthol cigarettes (only asked of those who had heard of menthol cigarettes). Respondents were asked to compare menthol and non-menthol cigarettes in terms of: how addictive; how harmful to the body; how much nicotine they contain; how refreshing the taste; how refreshing the sensation; how easy to smoke; and how soothing for a sore throat they are. In addition, two questions measured beliefs about the characteristics of menthol and non-menthol smokers: how popular they are; and how attractive they are.

Respondents answered each question by selecting one of five statements. For example, for the question “How addictive are menthol cigarettes compared to non-menthol cigarettes?” the response options were:

*Menthol cigarettes are a lot less addictive*

*Menthol cigarettes are less addictive*

*Menthol and non-menthol cigarettes are equally addictive*

*Menthol cigarettes are more addictive*

*Menthol cigarettes are a lot more addictive*

For analytic purposes, we combined the three response options that represented a neutral or negative belief about menthol cigarettes (e.g., *menthol and non-menthol cigarettes are equally addictive*, *menthol cigarettes are more addictive*, and *menthol cigarettes are a lot more addictive*). Even though the first of these response options was effectively neutral towards menthol cigarettes (e.g., *menthol and non-menthol cigarettes are equally addictive*), we classified these three response options as representing **anti-menthol beliefs**. The remaining two response options (e.g., *menthol cigarettes are a lot less addictive*, and *menthol cigarettes are less addictive*) represented the **pro-menthol belief**. Using logistic regressions, we examined whether endorsing the anti-menthol belief was associated with the likelihood of having no intention to smoke menthol cigarettes over the next year, and with having no intention use tobacco generally.

## **2. Results**

### **2.1. Awareness of Menthol Cigarettes**

Awareness of menthol cigarettes varied by age, such that it was lower among 13 – 15 year olds (42.2%) than among 16 – 17 year olds (58.8%),  $\chi^2 = 29.0$ ,  $p < .001$ . Awareness also varied by sex, but only among the 16 – 17 year olds, with awareness being lower among 16 – 17 year old males (53.1%) than 16 – 17 year old females (63.8%),  $\chi^2 = 6.32$ ,  $p = .012$ . However, awareness of menthols did not significantly differ according to race/ethnicity (either within the total sample or separately among 13 – 15 or 16 – 17 year olds). Similar levels of awareness of menthols among non-Hispanic White (49.1%), non-Hispanic Black (51.5%), and Hispanic (47.3%) youth, and among the total sample of 13 – 17 year old males (46.0%) and females (51.5%), may seem to be inconsistent with well-established race/ethnicity- and sex-based differences in the

prevalence of use of menthol cigarettes (Tobacco Products Scientific Advisory Committee, 2011). However, these unexpected findings are likely attributable to the current study's entirely non-smoking sample. Given evidence that the use of menthol cigarettes is lower among those who have just initiated smoking than among established smokers (Hersey et al., 2010), it is plausible that race/ethnicity- and sex-based differences in awareness of menthol cigarettes do not emerge until adolescents are regularly using tobacco.

## **2.2. Intentions to Use Tobacco and to Smoke Menthol Cigarettes**

Of respondents who had heard of menthol cigarettes ( $n = 553$ ), 67.8% had **no intention to use tobacco** over the next year. By comparison, 94.0% had **no intention to smoke menthol cigarettes** over the next year. There were no significant differences in intentions to use tobacco according to sex, age or race/ethnicity (note, however, that when we examined all respondents, regardless of their awareness of menthol cigarettes [ $N = 1134$ ], intentions to use tobacco did differ according to age, with 75.0% of 13 – 15 year olds not intending to use tobacco and only 66.7% of 16 – 17 year olds reporting no intention to use tobacco,  $\chi^2 = 8.46, p = .004$ ). There were also no significant differences in intentions to smoke menthol cigarettes according to sex, age or race/ethnicity. As above, the absence of sub-group differences in intentions to smoke menthol cigarettes and to use tobacco (among those who have heard of menthols) is likely attributable to the current study's entirely non-smoker sample.

## **2.3. Perceived Use of Menthol Cigarettes among Peers**

Among those who had heard of menthol cigarettes ( $n = 553$ ), just over one-third believed that of others their age, *none* smoke menthol cigarettes (33.9%). Almost two-thirds believed that *a few* or *some* others their age smoke menthol cigarettes (61.3%), and only 4.9% reported that *most* or *all* others their age smoke menthols.

## **2.4. Beliefs about Menthol Cigarettes**

Table 1 presents the proportion of respondents who held anti- and pro-menthol beliefs. Due to significant differences in awareness of menthol cigarettes between 13 – 15 and 16 – 17 year olds, results are presented separately for the younger and older age groups, as well as for the combined sample of 13 – 17 year olds. Among all 13 – 17 year olds, anti-menthol beliefs were held by

between 67.4% (menthol cigarettes are less refreshing in sensation) and 92.0% (*menthol smokers* are less attractive). Among 13 – 15 year olds, the percentages ranged from 69.5% to 92.8% for the same beliefs; and among 16 – 17 year olds, the percentages ranged from 65.1% to 91.1% (Table 1).

## **2.5. Association between Anti-Menthol Beliefs and Intentions to Smoke Menthol Cigarettes**

Table 1 also presents results from the logistic regression analyses that examined whether endorsing anti-menthol beliefs was associated with having no intention to smoke menthol cigarettes within the next year. As reported above, 94.0% of 13 – 17 year olds had no intention to smoke menthols over the next year. Table 1 shows that, among all 13 – 17 year olds, there was a tendency for those who endorsed anti-menthol beliefs to be *more* likely to have no intention to smoke menthol cigarettes, and this difference was statistically significant ( $p < .05$ ) or approaching significance ( $p < .10$ ) for four of the beliefs. Of those who endorsed the anti-menthol belief that menthol cigarettes are less refreshing in sensation, 95.6% had no intention to smoke menthols, whereas of those who endorsed the pro-menthol belief that menthols are more refreshing in sensation, only 90.2% had no intention to smoke menthols, OR = 2.38,  $p = .021$ . In a similar way, of those who endorsed the anti-menthol belief that menthols are harder to smoke, 95.1% had no intention to smoke menthols, whereas only 89.3% of those who endorsed the pro-menthol belief had no intention to smoke menthols, OR = 2.33,  $p = .027$ . Among those who endorsed the anti-menthol belief that *menthol smokers* are less popular than non-menthol smokers, 95.3% had no intention to smoke menthols, whereas only 83.7% of those who believed *menthol smokers* are more popular had no intention to smoke menthols, OR = 3.95,  $p = .001$ . Lastly, approaching statistical significance was the finding that 94.5% of those who endorsed the anti-menthol belief that *menthol smokers* are less attractive than non-menthol smokers had no intention to smoke menthols, whereas only 86.9% of those who believed that *menthol smokers* are more attractive had no intention to smoke menthols, OR = 2.58,  $p = .058$ . Although a similar pattern was observed for the remaining five menthol beliefs, these differences were not approaching statistical significance (Table 1). Therefore, while limited by a small proportion of respondents who had any intention to smoke menthol cigarettes (because of the entirely non-smoking sample), these analyses provide some evidence that menthol beliefs are associated with intentions to smoke menthol cigarettes.

**Table 1**

*Proportion of 13 – 17 Year Old Non-Smokers Endorsing Anti- and Pro-Menthol Beliefs, and the Association between Endorsing Anti-Menthol Beliefs and Having No Intention to Smoke Menthol Cigarettes over the Next Year*

	<b>Anti-Menthol Beliefs</b>		<b>Pro-Menthol Beliefs</b>		<b>Odds Ratio<sup>a</sup></b>
	Endorse %	<i>(Among those who Endorse)</i> <u>No Intention to Smoke Menthols</u> %	Endorse %	<i>(Among those who Endorse)</i> <u>No Intention to Smoke Menthols</u> %	
	Menthol cigarettes are/contain more:		Menthol cigarettes are/contain less:		
addictive <sup>all</sup>	87.3	<b>94.0</b>	12.7	<b>93.0</b>	1.17
addictive <sup>younger</sup>	86.5	<b>94.6</b>	13.5	<b>96.1</b>	0.72
addictive <sup>older</sup>	88.2	<b>93.4</b>	11.8	<b>89.2</b>	1.71
harmful to your body <sup>all</sup>	85.3	<b>94.0</b>	14.7	<b>93.4</b>	1.10
harmful to your body <sup>younger</sup>	85.2	<b>94.4</b>	14.8	<b>97.0</b>	0.52
harmful to your body <sup>older</sup>	85.3	<b>93.5</b>	14.7	<b>89.4</b>	1.70
nicotine <sup>all</sup>	82.3	<b>94.0</b>	17.7	<b>93.6</b>	1.07
nicotine <sup>younger</sup>	82.3	<b>94.6</b>	17.7	<b>95.8</b>	0.78
nicotine <sup>older</sup>	82.4	<b>93.2</b>	17.6	<b>91.1</b>	1.34
	Menthol cigarettes are less:		Menthol cigarettes are more:		
refreshing in taste <sup>all</sup>	69.5	<b>94.6</b>	30.5	<b>92.5</b>	1.42
refreshing in taste <sup>younger</sup>	70.3	<b>94.8</b>	29.7	<b>94.8</b>	1.01
refreshing in taste <sup>older</sup>	68.6	<b>94.3</b>	31.4	<b>90.0</b>	1.83

	<b>Anti-Menthol Beliefs</b>		<b>Pro-Menthol Beliefs</b>		Odds Ratio <sup>a</sup>
	Endorse %	(Among those who Endorse) <u>No</u> Intention to Smoke Menthols %	Endorse %	(Among those who Endorse) <u>No</u> Intention to Smoke Menthols %	
	Menthol cigarettes are less:		Menthol cigarettes are more:		
refreshing in sensation <sup>all</sup>	67.4	<b>95.6</b>	32.6	<b>90.2</b>	2.38*
refreshing in sensation <sup>younger</sup>	69.5	<b>95.8</b>	30.5	<b>92.5</b>	1.85
refreshing in sensation <sup>older</sup>	65.1	<b>95.4</b>	34.9	<b>87.9</b>	2.86*
easy to smoke <sup>all</sup>	79.2	<b>95.1</b>	20.8	<b>89.3</b>	2.33*
easy to smoke <sup>younger</sup>	79.6	<b>95.1</b>	20.4	<b>93.8</b>	1.27
easy to smoke <sup>older</sup>	78.8	<b>95.1</b>	21.2	<b>84.4</b>	3.62**
soothing for a sore throat <sup>all</sup>	71.4	<b>94.7</b>	28.6	<b>91.7</b>	1.62
soothing for a sore throat <sup>younger</sup>	72.1	<b>95.9</b>	27.9	<b>91.9</b>	2.03
soothing for a sore throat <sup>older</sup>	70.7	<b>93.4</b>	29.3	<b>91.5</b>	1.32
<i>menthol smokers are less popular</i> <sup>all</sup>	87.6	<b>95.3</b>	12.4	<b>83.7</b>	3.95**
<i>menthol smokers are less popular</i> <sup>younger</sup>	86.0	<b>95.5</b>	14.0	<b>90.5</b>	2.22
<i>menthol smokers are less popular</i> <sup>older</sup>	89.3	<b>95.1</b>	10.7	<b>74.0</b>	6.87**
<i>menthol smokers are less attractive</i> <sup>all</sup>	92.0	<b>94.5</b>	8.0	<b>86.9</b>	2.58 <sup>t</sup>
<i>menthol smokers are less attractive</i> <sup>younger</sup>	92.8	<b>95.4</b>	7.2	<b>87.6</b>	2.90
<i>menthol smokers are less attractive</i> <sup>older</sup>	91.1	<b>93.4</b>	8.9	<b>86.2</b>	2.28

<sup>a</sup> Odds Ratios indicate whether respondents who endorsed anti-menthol beliefs were more (odds ratio greater than 1.00) or less (odds ratio less than 1.00) likely to have no intention to smoke menthols, compared with those who endorsed pro-menthol beliefs.

<sup>all</sup> Analyses examine all 13 – 17 year olds who had heard of menthol cigarettes ( $N = 553$ ); <sup>younger</sup> Analyses examine all 13 – 15 year olds who had heard of menthol cigarettes ( $n = 294$ ); <sup>older</sup> Analyses examine all 16 – 17 year olds who had heard of menthol cigarettes ( $n = 259$ ).

\*\*  $p < .01$ ; \*  $p < .05$ ; <sup>t</sup>  $p < .10$



Follow-up analyses examined whether the same pattern of effects was observed when looking separately at the younger (13 – 15) and older (16 – 17) respondents. Table 1 shows that the three beliefs that were significantly associated with intentions to smoke menthol cigarettes in the total sample of 13 – 17 year olds (refreshing in sensation; easy to smoke; and *menthol smokers* are less popular), were also significantly associated with intentions to smoke menthol cigarettes among the 16 – 17 year olds, but not among the 13 – 15 year olds (although, the direction of the association was the same). Interaction analyses showed that in all three cases, the belief-intention association did not differ significantly depending on age group (results of interaction analyses not shown in Table 1). Therefore, because the belief-intention association was significant for the total sample and the relationship did not differ significantly by age, we conclude that the effect of endorsing these three anti-menthol beliefs on intentions to smoke menthol cigarettes is largely the same across 13 – 15 and 16 – 17 year old non-smokers, despite the non-significant effects in the younger sub-sample.

## **2.6. Association between Anti-Menthol Beliefs and Intentions to Use Tobacco**

Table 2 presents results from the logistic regression analyses that examined whether endorsing anti-menthol beliefs was associated with having no intention to use any form of tobacco (not just menthol cigarettes) over the next year (note that the percentages for those holding anti- and pro-menthol beliefs in Table 2 do not differ from those in Table 1). As reported above, overall 67.8% of 13 – 17 year olds who had heard of menthols had no intention to use tobacco over the next year. In Table 2, we see that there was a tendency for those who endorsed anti-menthol beliefs to be *more* likely to have no intention to use tobacco, and this difference was statistically significant ( $p < .05$ ) or approaching significance ( $p < .10$ ) for eight of the nine beliefs (Table 2).

Follow-up analyses examined whether the same pattern of effects was observed when looking separately at the younger (13 – 15) and older (16 – 17) respondents. Table 2 shows that of the eight beliefs that were significantly (or almost significantly) associated with intentions to use tobacco in the total sample of 13 – 17 year olds, only three were significantly associated with intentions among the 13 – 15 year olds, whereas six were also significantly (or almost significantly) associated with intentions among the 16 – 17 year olds. However, interaction analyses showed that the belief-intention association only differed significantly depending on

**Table 2**

*Proportion of 13 – 17 Year Old Non-Smokers Endorsing Anti- and Pro-Menthol Beliefs, and the Association between Endorsing Anti-Menthol Beliefs and Having No Intention to Use Tobacco over the Next Year*

	<b>Anti-Menthol Beliefs</b>		<b>Pro-Menthol Beliefs</b>		<b>Odds Ratio<sup>a</sup></b>
	Endorse  %	<i>(Among those who Endorse)</i> <b>No Intention to Use Tobacco</b>  %	Endorse  %	<i>(Among those who Endorse)</i> <b>No Intention to Use Tobacco</b>  %	
	Menthol cigarettes are/contain more:		Menthol cigarettes are/contain less:		
addictive <sup>all</sup>	87.3	<b>68.8</b>	12.7	<b>58.2</b>	1.58 <sup>t</sup>
addictive <sup>younger</sup>	86.5	<b>69.8</b>	13.5	<b>63.2</b>	1.35
addictive <sup>older</sup>	88.2	<b>67.8</b>	11.8	<b>52.0</b>	1.94 <sup>t</sup>
harmful to your body <sup>all</sup>	85.3	<b>69.0</b>	14.7	<b>57.8</b>	1.62 <sup>t</sup>
harmful to your body <sup>younger</sup>	85.2	<b>69.6</b>	14.8	<b>65.4</b>	1.21
harmful to your body <sup>older</sup>	85.3	<b>68.4</b>	14.7	<b>49.4</b>	2.22*
nicotine <sup>all</sup>	82.3	<b>69.5</b>	17.7	<b>58.5</b>	1.62*
nicotine <sup>younger</sup>	82.3	<b>69.3</b>	17.7	<b>68.2</b>	1.05
nicotine <sup>older</sup>	82.4	<b>69.7</b>	17.6	<b>47.4</b>	2.56**
	Menthol cigarettes are less:		Menthol cigarettes are more:		
refreshing in taste <sup>all</sup>	69.5	<b>71.2</b>	30.5	<b>59.4</b>	1.69*
refreshing in taste <sup>younger</sup>	70.3	<b>71.8</b>	29.7	<b>62.2</b>	1.55
refreshing in taste <sup>older</sup>	68.6	<b>70.5</b>	31.4	<b>56.4</b>	1.85*

	<b>Anti-Menthol Beliefs</b>		<b>Pro-Menthol Beliefs</b>		<b>Odds Ratio<sup>a</sup></b>
	Endorse	<i>(Among those who Endorse)</i>	Endorse	<i>(Among those who Endorse)</i>	
	<u>No Intention to Use Tobacco</u>	<u>No Intention to Use Tobacco</u>	<u>No Intention to Use Tobacco</u>	<u>No Intention to Use Tobacco</u>	
	%	%	%	%	
	Menthol cigarettes are less:		Menthol cigarettes are more:		
refreshing in sensation <sup>all</sup>	67.4	<b>71.9</b>	32.6	<b>57.6</b>	1.88**
refreshing in sensation <sup>younger</sup>	69.5	<b>72.0</b>	30.5	<b>61.5</b>	1.61
refreshing in sensation <sup>older</sup>	65.1	<b>71.8</b>	34.9	<b>53.8</b>	2.19**
easy to smoke <sup>all</sup>	79.2	<b>71.3</b>	20.8	<b>52.6</b>	2.25**
easy to smoke <sup>younger</sup>	79.6	<b>75.2</b>	20.4	<b>44.4</b>	3.80**
easy to smoke <sup>older</sup>	78.8	<b>67.0</b>	21.2	<b>61.3</b>	1.28
soothing for a sore throat <sup>all</sup>	71.4	<b>70.9</b>	28.6	<b>57.7</b>	1.78**
soothing for a sore throat <sup>younger</sup>	72.1	<b>73.0</b>	27.9	<b>57.4</b>	2.01*
soothing for a sore throat <sup>older</sup>	70.7	<b>68.4</b>	29.3	<b>58.1</b>	1.56 <sup>t</sup>
<i>menthol smokers are less popular</i> <sup>all</sup>	87.6	<b>69.4</b>	12.4	<b>52.6</b>	2.05*
<i>menthol smokers are less popular</i> <sup>younger</sup>	86.0	<b>71.7</b>	14.0	<b>50.1</b>	2.53*
<i>menthol smokers are less popular</i> <sup>older</sup>	89.3	<b>67.1</b>	10.7	<b>56.4</b>	1.58
<i>menthol smokers are less attractive</i> <sup>all</sup>	92.0	<b>68.2</b>	8.0	<b>56.1</b>	1.68
<i>menthol smokers are less attractive</i> <sup>younger</sup>	92.8	<b>69.1</b>	7.2	<b>64.5</b>	1.23
<i>menthol smokers are less attractive</i> <sup>older</sup>	91.1	<b>67.2</b>	8.9	<b>48.5</b>	2.18*

<sup>a</sup> Odds Ratios indicate whether respondents who endorsed anti-menthol beliefs were more (odds ratio greater than 1.00) or less (odds ratio less than 1.00) likely to have no intention to use tobacco, compared with those who endorsed pro-menthol beliefs.

<sup>all</sup> Analyses examine all 13 – 17 year olds who had heard of menthol cigarettes ( $N = 553$ ); <sup>younger</sup> Analyses examine all 13 – 15 year olds who had heard of menthol cigarettes ( $n = 294$ ); <sup>older</sup> Analyses examine all 16 – 17 year olds who had heard of menthol cigarettes ( $n = 259$ ).

\*\*  $p < .01$ ; \*  $p < .05$ ; <sup>t</sup>  $p < .10$

age group in one case. Endorsing the anti-menthol belief that menthol cigarettes are harder to smoke than non-menthol cigarettes was significantly associated with having no intention to use tobacco among the total sample of 13 – 17 year olds, and among the 13 – 15 year olds, but not among the 16 – 17 year olds (Table 2). This association differed significantly by age group ( $p = .018$ ), providing us with some confidence that this belief-association is stronger for the younger than for the older respondents. However, on the whole, our finding that endorsing anti-menthol beliefs is associated with having no intention to use tobacco appears to be largely the same for both 13 – 15 and 16 – 17 year olds.

These results indicate that menthol beliefs are associated with intentions to use tobacco, such that endorsing anti-menthol beliefs is associated with a greater likelihood of having no intention to use tobacco. However, one limitation of these analyses is that they were limited to those 13 – 17 year old non-smokers who had heard of menthol cigarettes. Although our data suggest that changing youths' beliefs about menthol cigarettes may protect them from using tobacco, it is also possible that youth may be protected from using tobacco by simply being unaware of menthol cigarettes. We therefore conducted an additional analysis to examine whether knowing about menthol cigarettes predicted intentions to use tobacco in the next year, while controlling for age (a significant predictor of both knowing about menthol cigarettes and intentions to use tobacco). Using the full sample of eligible 13 – 17 year olds ( $N = 1134$ ), we found that those who reported that they had *not* heard of menthol cigarettes were more likely to have *no intention* to use tobacco over the next year, compared with those who had heard of menthol cigarettes (controlling for age group),  $OR = 1.39, p = .023$ . These findings indicate that there is some risk that a well-intentioned campaign aimed at changing the menthol beliefs of those who had already heard of menthol cigarettes (in an effort to reduce their intentions and/or smoking behaviors) could inadvertently raise awareness of menthol cigarettes, thereby leading to overall increased intentions to use tobacco over the next year.

### **3. Summary**

- Overall, just under half (48.8%) of the 13 – 17 year old non-smokers in this study reported that they had heard of menthol cigarettes. One limitation of our study is that our question examining awareness of menthols did not capture the youth who knew about specific

menthol brands, but did not know that the brands were menthol cigarettes per se (e.g., know about Newport cigarettes but do not know that they are menthol cigarettes). Previous research has shown that both youth and adult smokers may not always recognize that the cigarettes they smoke are menthols (Giovino et al., 2004; Hersey et al., 2010), and this may particularly be a problem for African-American youth (Giovino et al., 2004). Therefore, it is possible that our study underestimates the level of awareness of menthol cigarettes among 13 – 17 year olds. However, if a campaign message were to target beliefs about menthols in general, instead of beliefs about any particular brand of menthol cigarettes, then the current findings would still be relevant to the development of such a message.

- Overall, the vast majority of respondents indicated that they had no intention to smoke menthol cigarettes over the next year (94.0% among 13 – 17 year olds who had heard of menthols). In addition, more than two-thirds of respondents had no intention to use tobacco over the next year (67.8% among 13 – 17 year olds who had heard of menthols).
- Among all 13 – 17 year olds, anti-menthol beliefs were endorsed by more than two-thirds of respondents (endorsement levels ranged between 67.4% and 92.0%), indicating that only a small proportion of youth who have heard of menthol cigarettes believe that these cigarettes have positive characteristics (i.e., between 32.6% and 8.0%).
- Among all 13 – 17 year olds, we found that there was a tendency for those who endorsed anti-menthol beliefs to be more likely to have no intention to smoke menthol cigarettes over the next year, compared with those who endorsed pro-menthol beliefs, and this association was statistically significant for three of the nine beliefs. Despite non-significant results among 13 – 15 year olds alone, interaction analyses indicated that in all three cases, the belief-intention association did not differ significantly by age, so we conclude that the effect of endorsing these three beliefs is largely the same across both age groups.
- We also found that there was a strong association between endorsing anti-menthol beliefs and not intending to use tobacco over the next year. Among all 13 – 17 year olds, this association was statistically significant for six of the nine beliefs and a similar pattern of results was obtained when examining the 13 – 15 and 16 – 17 year olds separately (there was only one significant interaction with age). Given these findings, it is possible that the observed association between anti-menthol beliefs and intentions to smoke menthol cigarettes was primarily driven by the association with intentions to use any tobacco

products. Unfortunately, we did not have adequate power in this dataset to test this possibility (i.e., to examine the association between anti-menthol beliefs and intentions to smoke menthols *only among* those respondents with some intention to use tobacco).

- We found that *not* having heard of menthol cigarettes was associated with a greater likelihood of having *no intention* to use tobacco products over the next year (even after controlling for age). Therefore, there is a risk that a well-intentioned campaign message could raise awareness of menthols among youth and could therefore have the unwanted effect of increasing intentions to use tobacco among those who had been unaware of menthols.
- These findings provide some evidence that 13 – 17 year old current non-smokers who hold anti-menthol beliefs are more likely to have no intention to smoke menthol cigarettes, and no intentions to use tobacco products more generally over the next year. It is particularly notable that these associations were observed within a sample of non-smokers who have had very little, if any, experience with tobacco products. While these findings indicate that smoking prevention campaigns may effectively reduce intentions to use tobacco products (and to smoke menthol cigarettes) if they are able to increase anti-menthol beliefs, it is important to note that the cross-sectional nature of this data means that we cannot be confident in the causal direction of these associations (e.g., it is possible that having no intention to smoke menthol cigarettes *causes* young people to hold anti-menthol beliefs), and we cannot guarantee that campaign decisions based on these data will be correct. Nonetheless, these data do provide some insight into the particular anti-menthol beliefs that, if targeted by a smoking prevention campaign, are most likely to lead to reduced intentions to smoke.

#### 4. References

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