

**UCSF**

**Tobacco Control Policy Making: United States**

**Title**

Menthol Cigarettes and Smoking Cessation Behavior: A White Paper

**Permalink**

<https://escholarship.org/uc/item/47w7f4m5>

**Author**

Anderson, Stacey J PhD University of California - San Francisco

**Publication Date**

2010-10-07

Menthol Cigarettes and Smoking Cessation Behavior: A White Paper

Stacey J. Anderson, PhD

University of California, San Francisco

Author Note

Stacey J. Anderson, PhD, Department of Social and Behavioral Sciences, University of California San Francisco.

This research was supported by the Department of Health and Human Services Contract HHSN261201000035I.

Correspondence concerning this manuscript should be addressed to Stacey J. Anderson, PhD, Department of Social and Behavioral Sciences, 3333 California St. Suite 455, University of California, San Francisco, CA 94143-0612. E-mail: [stacey.anderson@ucsf.edu](mailto:stacey.anderson@ucsf.edu)

## Abstract

Publicly available internal tobacco industry documents were analyzed to explore questions regarding menthol cigarettes and cessation behavior, using the following as initial questions: 1) Compared to non-menthol smokers, do menthol smokers have a harder time quitting, report more or fewer quit attempts, and/or have higher or lower quit rates? 2) Compared to non-menthol smokers, are menthol smokers more or less likely to relapse or delay quitting, and/or to experience different odds of maintaining abstinence long-term? Tobacco companies largely considered reviews of the academic literature on these questions; therefore, documentary evidence was employed to refine research questions. More than 500 relevant documents were identified on 1) perceived sensory and taste rewards of menthol and potential relation to quitting; 2) motivation or desire to quit among menthol users; and 3) socio-demographic correlates of both menthol usage and cessation patterns.

Menthol's cooling and anesthetic effects mask the short-term negatives of smoking such as throat pain, burning, and cough. This may provide superficial physical relief as well as psychological assurance against concerns about health that would otherwise motivate smokers to quit. Menthol smokers, particularly women, also perceive the minty aroma of menthol cigarettes to be more socially acceptable than non-menthol cigarettes, a perception that lessens the impact of smoking denormalization on quitting motivation. Relative to the overall smoking market, menthol smokers tend to be younger, female, and non-white; this description also fits those smokers who have a harder time of quitting and staying quit.

Document analysis suggests that menthol in cigarettes may encourage experimenters who find non-mentholated cigarettes too harsh, including young or inexperienced users, to progress to

regular smoking rather than quitting, and may inhibit the desire to quit among established menthol smokers who have become accustomed to the taste and sensation of menthol cigarettes.

### Menthol Cigarettes and Smoking Cessation Behavior: A White Paper

The Family Smoking Prevention and Tobacco Control Act gave the US Food and Drug Administration (FDA) regulatory authority over tobacco products. On September 22, 2009, the FDA exercised this authority when it announced the ban of some cigarette flavorings. This ban did not include menthol, however, as it was excluded from the list of banned flavorings originally identified in the Act. Menthol's exclusion from the list of prohibited flavor additives in cigarettes has promoted discussion among many in the public health arena.<sup>1</sup> The Act included a requirement to create the Tobacco Products Scientific Advisory Committee (TPSAC) within the FDA's Center for Tobacco Products. TPSAC is charged with advising the FDA Commissioner on the regulation of tobacco products, including the use of menthol as a characterizing cigarette flavoring and the impact of mentholated cigarettes on public health, with special attention given to children, African Americans, Hispanics and other racial and ethnic minorities.

The wide use of menthol in cigarettes is due to its minty flavor, aroma, cooling characteristics and physiological effects on the smoker.<sup>2,3</sup> The isomer l-menthol is the largest component of peppermint oil extracted from the two significant types of peppermint plants, *Mentha piperita* and *Mentha arvensis*. There are significant taste differences among the various isomers. l-menthol imparts the well-known mint-like taste and desired cooling effect.<sup>3</sup> The concentration of menthol in tobacco products varies according to the product and the flavor desired, but is present in 90% of all tobacco products, both "mentholated" and "non-mentholated".<sup>3,4</sup>

The market share of filter-tipped mentholated cigarettes has ranged from 1.1% in 1956 to 27.3% in 1983 to 20% in 2006.<sup>3,5</sup> Data from 2006 show that past month use of mentholated brands among cigarette smokers aged 12 or older varies by race and ethnicity:

- 82.6% African American
- 53.2% Native Hawaiian
- 32.3% Hispanic
- 31.2% Asian
- 24.8% American Indian/Alaska Native
- 23.8% non-Hispanic white<sup>6</sup>

Although menthol is an FDA-approved food additive, the FDA is now considering regulating its use in cigarettes and has requested a review of tobacco industry documents to answer questions regarding a number of menthol-related topics. Questions originally asked to guide the research for this paper, relating to menthol's potential role in cessation, were as follows:

1. Compared to non-menthol smokers, do menthol smokers have a harder time quitting, report more or fewer quit attempts, and/or have higher or lower quit rates?
2. Compared to non-menthol smokers, are menthol smokers more or less likely to relapse or delay quitting, and/or to experience different odds of maintaining abstinence long-term?

Regarding the potential direct role of menthol in quitting, quit rates, and relapse, it appears that most of the information tobacco companies considered came from the biomedical literature and not from studies carried out by the companies themselves, who seem to have conducted very little in-house research on these exact questions. From this review of the documents, however, it appeared that there was considerably more interest in menthol's indirect role in keeping smoking attractive enough to dissuade cessation. Given that, the present author refined the research questions to reflect the tobacco industry's apparent interest in these indirect mechanisms and

their potential impact on cessation. Important areas of focus to better understand the industry's interest in the indirect role of menthol in smoking cessation were identified as follows:

1. Perceived sensory and taste rewards of menthol and potential relation to quitting
2. Motivation or desire to quit among menthol users, including health concerns and social unacceptability of smoking
3. Socio-demographic correlates of both menthol usage and cessation patterns

Although there have been improvements in recent years in sample size and inclusion of additional potential predictive variables in studies of menthol and cessation, the overall body of evidence regarding direct effects of menthol in cigarettes on smoking cessation is still conflicting. Given the literature that suggests the importance of subjective experiences, beliefs, and demographic and socio-cultural factors that may have indirect relations with menthol use and motivation to quit, this report sought to expand the search on internal documents relevant to menthol and cessation issues to include these potential indirect factors.

### **Method**

In this qualitative research study of the digitized repository of previously internal tobacco industry documents, a snowball sampling design<sup>26</sup> was used to search the Legacy Tobacco Documents Library (LTDL) (<http://legacy.library.ucsf.edu>). The LTDL was systematically searched between May 15 through August 1, 2010, utilizing standard documents research techniques. These techniques combine traditional qualitative methods<sup>27</sup> with iterative search strategies tailored for the LTDL data set.<sup>28</sup>

Based on the FDA staff-supplied research questions and refined questions as identified by the current author (see Introduction, above), initial keyword searches combined terms related to: menthol, quit/quitting/quitter, cessation, relapse, motivation, research, quantitative, qualitative,

and report. This initial set of keywords resulted in the development of further search terms and combinations of keywords including menthol cigarette brand names (e.g., Kool, Newport, Salem), identified demographic groups (e.g., African American, Black, Asian, women/woman/female, young adult smoker/YAS/YAMS/YAFS), “psychographic” segmentation reports (e.g., the “Coolness” segment referring to menthol users), identified motivations (e.g., sensation, health, peer acceptance, offend, smell), project names (e.g., Project GS, Project UT), and individuals and companies named in correspondences and on research reports (e.g., A. Udow; Booz, Allen, & Hamilton, Inc.). Of the approximately 11 million documents available in the LTDL, the iterative searches returned tens of thousands of results (see Appendix). For example, a search of all tobacco industry document collections on the LTDL for the keyword “menthol” alone would yield over 800,000 documents. The results that are returned in the LTDL include multiple copies of many documents, so the researcher must decide which irrelevant and duplicate documents to exclude. Relevance was based on whether, upon electronically searching or reading a document, it included content related to the topic or the specific questions presented by the FDA staff and refined by the current author. Tobacco companies investigated issues in order to increase their share of market, rather than to understand public health issues; thus many of the tens of thousands of returned documents with these search terms did not appear to be directly relevant. For each set of results, the researcher reviewed the first 50-350 documents. If documents did not appear to be relevant to the research questions, or if there was a repetitive pattern of documents, the researcher moved on to the next search term. Among the reports, correspondence, and studies conducted by product development and research departments of the major tobacco companies (American Tobacco, British American Tobacco (BAT), Brown & Williamson, Imperial Tobacco, Lorillard, Philip Morris, and RJ Reynolds),



relevant documents were found in the following subject areas: 1) perceived sensory and taste rewards of menthol and potential relation to quitting; 2) motivation or desire to quit among menthol users, including health concerns and social unacceptability of smoking; and 3) socio-demographic correlates of both menthol usage and cessation patterns. A final collection of 509 documents were deemed relevant to one or more of the research questions. Memos were written to summarize the relevant documents to further narrow down to the 60 relevant documents that are cited in this white paper. The Appendix details the results of the searches and the number of documents screened and further reviewed.

### **Limitations**

Tobacco industry document research presents unique challenges,<sup>26</sup> and results should be interpreted within the context of known limitations, such as the vast number of available documents, time restrictions, and the use of code words and acronyms.

The sheer quantity of available documents (over 60 million pages) forces researchers to make decisions about which search terms retrieve the most relevant material. Further, the LTDL is frequently updated as tobacco companies provide additional material and documents become available through litigation. The document searches were conducted over a thirteen week period. Given the short period of time for conducting this project (LTDL archival research often takes a year or more to complete), the researcher had to strategically screen the documents through the process discussed above.

In analyzing the documents in a limited time frame, context may have been lost and, therefore, this white paper cannot be a comprehensive report of all documents related to menthol marketing and consumer perceptions of menthol. Understanding the time period when a document was written, who wrote a document, why a document was written, or why a study was

performed requires time for reviewing and linking documents together. It is also difficult to compare statistics gathered using different methodologies used by numerous companies over several decades.

Even if there had been more time for searching, it is unlikely that a complete picture of the tobacco industry’s research about menthol marketing and consumer perceptions of menthol could be compiled. There is evidence that the industry tried to hide its findings, although it is unclear from whom. For example, in a 1974 BAT memo about a visit to BIBRA, a toxicology consulting firm, it was noted that “Reference to menthol should be omitted from such documents [invoices], which should refer generally to toxicity studies.”<sup>29</sup> Brown and Williamson used the code terms, such as “Kintolly,” “Tolkin,” “Harpat,” “Polar Bear,” and “Cenmap” when referring to menthol.<sup>30</sup> Acronyms were also commonly used, which are often unclear if the context is unknown.

Research in the LTDL typically involves repeating the iterative search process (including searching all code words and acronyms learned through the process) until saturation of both keywords and documents is reached. Unfortunately, saturation was not reached for this white paper; however, the documentary evidence presented in this paper supports the primary findings.

### Results

Table 1. summarizes the areas of research focus and basic findings.

<b>Table 1: Areas of research focus and basic findings.</b>	
<b>Area of research focus</b>	<b>Finding</b>
1. Perceived sensory and taste rewards of menthol and potential relation to quitting	Menthol smokers perceive pleasant minty or medicinal-like tastes, and soothing, cooling, anesthetic sensations with menthol cigarettes. These perceptions appear to discourage quitting in menthol smokers.
2. Motivation or desire to quit among menthol users, including health concerns and social	Two main motivations for smokers to quit are health concerns and the social unacceptability of

<p>unacceptability of smoking</p>	<p>smoking. Menthol’s cooling, soothing, and anesthetic effects mask superficial health effects such as throat irritation and cough in menthol smokers, which lessen their concern about health effects. Menthol smokers also believe menthol smoke to smell better and be less offensive to others, which may lessen menthol smokers’ sense of the social unacceptability of smoking. These aspects of menthol appear to discourage motivation or desire to quit among menthol smokers.</p>
<p>3. Socio-demographic correlates of both menthol usage and cessation patterns</p>	<p>Menthol appeals to some socio-demographic groups who are also known to have difficulty initiating quitting or staying quit, including women, lower income smokers, and African Americans. Although it is not clear why there is substantial overlap between the overall menthol profile (younger, non-white, female, and low income) and socio-demographic variables that predict difficulty in quitting or staying quit, it appears that tobacco companies took an interest in this overlap.</p>

Perceived sensory and taste rewards of menthol and potential relation to quitting

*Menthol smokers perceive pleasant minty or medicinal-like tastes, and soothing, cooling, anesthetic sensations with menthol cigarettes. These perceptions appear to discourage quitting in menthol smokers.*

Menthol styles of cigarettes were traditionally marketed as a remedy to the dryness and irritation smokers experience when smoking regular cigarettes.<sup>31,32</sup> The anesthetic and cooling qualities of menthol, along with the minty menthol taste, change the regular smoking experience and, to some smokers, make it a more palatable one.<sup>33,34</sup> “Personal Concerns Smokers” are those who want the “lowest tar and nicotine with minimal taste trade-offs”.<sup>35</sup> Although “low-tar” products tend to dominate in this segment of smokers, RJ Reynolds (RJR) noted in in a “Market Study Mindset, Attitude, and Usage Qualitative Report” in late 1990 that Personal Concerns “respondents cite the harshness of regular cigarettes as the reason for switching to Lights or

menthol. They want flavor and smoking satisfaction, without the negatives of regular cigarettes...” The report cited the representative comment of one respondent: “I started with Marlboro, but it tore up my throat. Salem Lights are easier on my throat”.<sup>35</sup>

A document retrieved for the Cipollone v. Liggett case provides analysis of a report from Philip Morris (PM) Consumer Research and Marketing Department executive A. Udow. This analysis reads,

The report takes a special interest in “occasional menthol smokers.” They attempt to estimate the volume of menthol cigarettes consumed by occasional menthol smokers. It is possible that such people are being encouraged to switch to menthol cigarettes when their throats appear to be raw or to alleviate other symptoms. This may have important implications.<sup>36</sup>

Although it is unclear what the analyst thought those important implications may be, a 1990 Booz, Allen, & Hamilton, Inc. report strategizing for RJR in the face of threats to industry volume suggests the role of menthol. The report emphasizes that the “[o]riginal reason for menthol was therapeutic — providing a refreshing alternative to hot, harsh tobacco taste of existing brands”, and that a cigarette “[p]roduct should provide a smooth smoking experience that is easy to adapt to”.<sup>37</sup>

Menthol acts as a means of masking, covering up, or avoiding the negatives of smoking, particularly the heat, harshness, and dryness of cigarette smoke. RJR observed in 1980 that “[m]enthol smokers want to smoke a ‘refreshing’ cigarette.... [T]hey smoke menthol cigarettes primarily to avoid negatives they associate with non-menthol smoking, i.e., harshness, dryness, hot taste, unpleasant aftertaste.”<sup>38</sup> Women in particular are seen as being sensitive to the heat and harshness of regular cigarettes. British American Tobacco (BAT) wrote in 1976, “female smokers were shown to be more sensitive than male smokers to changes in smoke temperature at shorter butt lengths.... Compared to the control cigarette (normal smoke temperature) women

smoked an experimental cigarette (higher smoke temperature) so as to leave a longer butt.”<sup>39</sup>

Butt length has been recognized by the industry to have an effect on the perception of strength of a cigarette, with smoking to a shorter butt leading to perceptions of a stronger<sup>40</sup> or more irritating<sup>41</sup> cigarette. In terms of perception of heat in cigarette smoke, menthol’s ability to impart a cooling sensation is one of the most frequently cited reasons for staying with menthol cigarettes.<sup>34,42,43</sup>

In addition to the avoidance of the negative sensations of smoking that menthol facilitates, menthol adds a flavor and a sensation unassociated with tobacco that menthol smokers enjoy in a way similar to an over-the-counter throat lozenge, a candy treat, and even a drug. A 1979 Roper Organization study found that “[m]enthol seems to have some of the properties of a drug.... [s]omething with the combined properties of Listerine, Anbesol, Chloraseptic lozenges, Lavoris, Life Savers and ice comes to mind.”<sup>44</sup> Jay Faberman of the PM Market Research Department wrote to Al Udow in 1969 that “menthol cigarettes add the sensations of coolness and menthol taste which yield a desired sensory experience in about one-fifth of all smokers.”<sup>45</sup> The 1979 Roper study similarly asserted,

The key effects that seem to appeal to menthol smokers are menthol's perceived  
Cooling effects  
Clean, antiseptic effects  
Slightly numbing, anesthetic effects  
Heady, lifting effects<sup>44</sup>

These experiences appear to engender a strong affinity for, and loyalty to, menthol cigarettes among their users. The Landis Group conducted a qualitative study of menthol cigarette users for PM and reported in July, 1992, that “[m]ost respondents said they would be motivated to try a new cigarette if one was ‘offered for free’, but they would only be motivated to switch if it had

a similar flavor to the brand they were presently smoking. Flavor/taste seems to be the most important element for menthol smokers.”<sup>46</sup>

The Nowland Organization, Inc, conducting an analysis in 1976 for Lorillard, manufacturer of the popular Newport brand, noted the most-frequently mentioned positive descriptors in a desirable cigarette were

- mild/mildness
- smooth
- flavorful, tasty
- satisfying, fulfilling
- aroma/aromatic
- cool
- relaxing, soothing, calming
- pleasing/pleasant, enjoyable
- menthol (cited by menthol smokers only)
- rich
- full-bodied/full
- mellow<sup>47</sup>

These descriptors were generated by interviewees in a study not of menthol explicitly, but of “SHF” (“super hi-fi”,<sup>48</sup> or super high filtration cigarettes). With the exception of the explicit mention of menthol by menthol smokers only, these descriptors have strong overlap with the most desirable qualities of menthol cigarettes often generated by menthol smokers. The 1976 analysis continued, “[i]nterestingly, a mild taste is most frequently defined as a nonirritating taste – not harsh, not burning, ‘it doesn’t make you cough’ or ‘choke’”<sup>47</sup> -- observations remarkably similar to understanding a primary motivation for smoking menthol.

One main difference between Lorillard’s “SHF” classified smokers and menthol smokers is in the amount of enjoyment a smoker seeks depending upon the style of cigarette smoked.

Describing “SHF” smokers, Nowland continues,

Those who do not find taste an important variable indicate that they do not smoke primarily for sensory enjoyment but, rather, from habit, to relax, to have something in

their hand, etc.; or they just do not give taste much thought ;or all they ask is that the taste be smooth, mild, non-irritating. Several (SHF [super “hi-fi”, or super high filtration] smokers disproportionately) say they do not particularly like the taste of any cigarette.<sup>47</sup>

Whereas smokers of ostensibly “low yield” products (e.g., “hi-fi/high filtration”, “low-tar”, etc.) typically gravitate toward those styles for negative reasons such as health concerns or even feelings of guilt about smoking, menthol smokers gravitate toward menthol styles for affirmative reasons of sensation, taste, and aroma. Perhaps not surprisingly, then, menthol smokers “express slightly less desire to quit smoking than do non-menthol smokers--39% would like to quit, versus 43% of non-menthol smokers”.<sup>44</sup> Even among those menthol users who recognize the negatives associated with smoking, menthol is perceived to be something of a solution to the negatives and an alternative to quitting. This was explicitly acknowledged in a 1973 study of the attitudes and behaviors of menthol smokers conducted for RJR:

Generally when a respondent reported that he made a conscious decision to switch to a mentholated brand it was because of some problem, minor or major. For instance, many switched to mentholated cigarettes because of throat irritation, colds, coughs or chronic bronchitis. Sometimes respondents saw smoking a mentholated brand as the only alternative to giving up smoking altogether.<sup>49</sup>

#### Motivation or desire to quit among menthol users

*Two main motivations for smokers to quit are health concerns and the social unacceptability of smoking. Menthol’s cooling, soothing, and anesthetic effects mask superficial health effects such as throat irritation and cough in menthol smokers, which lessen their concern about health effects. Menthol smokers also believe menthol smoke to smell better and be less offensive to others, which lessens menthol smokers’ sense of the social unacceptability of smoking. These aspects of menthol appear to discourage motivation or desire to quit among menthol smokers.*

*Health concerns.* Health concerns serve as one of the primary reasons smokers quit.

As Jay Faberman noted in his 1969 memo to Al Udow,

All available evidence suggest that, basically, people stop smoking because they have become concerned about the health problem associated with smoking. The 1967 Roper Study found that 41% of all smokers were concerned about the health hazard causing at least half of those smokers to change their smoking habits.<sup>45</sup>

Menthol's ability to mask the pain and burn of smoking, and its perception as a milder and therefore safer product as compared to "regular" cigarettes, has caused switching from non-menthol to menthol brands and styles, particularly among young people who start with popular youth brands. For instance, The Sherman Group Inc. conducted a reconnaissance study of Newport for RJR in 1976 and found,

In rejecting the "regular" cigarette taste, the smokers are referring back to their own experiences. These young smokers began smoking the "popular" brands, Winston, Marlboro, Tareyton and Kents, etc ., and moved to menthols for a variety of reasons or circumstances; the rejection of tobacco taste, the search for a "milder" cigarette, personal influence, or the circumstances of having a cold and wanting to continue smoking, but being unable to "handle" the hot taste of cigarettes in an already irritated throat.<sup>50</sup>

Instead of quitting as a means of protecting an injured throat, menthol imparts cooling and anesthetic sensations that allow some smokers dissatisfied with the smoking experience to continue smoking. This is viewed as a potential opportunity for tobacco companies; The Landis Group reported to PM in 1992 that

Over half of the people interviewed were non-menthol smokers first, and changed to menthol for a variety of reasons : "during an illness the non-menthol was too harsh", "tried a friend's menthol, and realized the taste was better", "got tired of the tobacco taste", etc . In view of these findings, it appears there may be an opportunity to convert non-menthol smokers to menthol cigarettes.<sup>46</sup>

Smokers participating in a study conducted by Lorillard's Market Research Department in 1972<sup>51</sup> affirm menthol's ability to assuage the unpleasantness of smoking non-menthol styles.

Statements by those who switched from a non-menthol to a menthol brand were as follows:

[switcher from Camel to Kool]: "I switched for taste – it seemed milder and less burning in my mouth. The Camels began to taste harsh and bitter and hot to smoke."



[switcher from Marlboro to Kool]: “I found that I liked the taste and flavor much better. It was more soothing to my throat that's all. I had a cold and I decided to switch to Kools.”

[switcher from Pall Mall to Kool]: “I started smoking Kools when I had a cold. It felt good so I kept on smoking them. I like the taste of menthol.”

[switcher from Winston to Kool]: “Winstons gave me a headache so I switched to Kools.”

[switcher from Pall Mall to Kool]: “The taste was getting too strong for me and I needed a milder smoke. Pall Mall was too harsh, too rough, too hot – I wanted a cooler, less biting smoke.”

[switcher from Winston to Kool]: “I had no cough with Kool. After first smoke, it gets stronger and stronger as you smoke.”<sup>51</sup>

An undated report by Brown & Williamson (B&W) on “lapsed/quitting smokers” noted that “health-related reasons are by far the most prevalent” reasons to quit and observed that the reasons for consumers’ awareness of “less strong” cigarette brands including Salem and Newport were “taste/flavour, tar/nicolene [sic], [and] throat related”.<sup>52</sup> The report found an “increase in concern [about health issues] but decline in desire to give up”.<sup>52</sup> Consequently, the report stated, “Salem Menthol (40%) still tops the list of such [less strong] cigarettes. Its share of perceived mild brands has actually increased significantly (from 27%, 2 years back) and this may reflect its rising popularity/brand awareness.”<sup>52</sup>

Cunningham & Walsh compiled a report for B&W in 1980 in which they observed that Kool’s “[r]emedial specialty brand image” (i.e., a brand that offers a remedy to the harshness and burn of smoking) in the early 1950s “benefits [the b]rand as smokers perceive menthol as less harmful”.<sup>53</sup> In a 1960s brand evaluation, B&W noted that “[e]mphasis on the throat, with its important health implications, has... been an important part of Kool advertising since 1960. In light of the ‘smoking climate’ in recent years this could very well have benefitted the brand”,<sup>54</sup> the “‘smoking climate’ in recent years” referring to the climate of growing smoking-related health concerns. The Creative Research Group perhaps described the soothing qualities of

menthol and its potential role in discouraging concerned smokers from quitting most plainly in a 1986 report for Imperial Tobacco. The report stated:

Quitters may be discouraged from quitting, or at least kept in the market longer, by either of the two product opportunities noted before. A less irritating cigarette is one route. (Indeed, the practice of switching to lower tar cigarettes and sometimes menthol in the quitting process tacitly recognizes this.) The safe cigarette would have wide appeal, limited mainly by the social pressures to quit. Unsuccessful quitters are moved disproportionately by physical reactions and social forces to stop smoking (but health remains the most often specified reason).<sup>55</sup>

These statements explicitly recognize menthol's ability to sooth irritation as a barrier to quitting, and acknowledge the lack of quitting success in people who claim physical reactions (like an irritated throat) as their primary motivation for quitting.

According to a May 30, 1973 Lorillard meeting agenda to discuss "Kent Menthol 100's", the objective of a menthol line extension of Lorillard's "low-tar" Kent brand was to "convince smokers of competitive menthols (as well as smokers contemplating entering the category) that Kent menthol is the menthol that offers refreshing menthol smoking satisfaction and health reassurance."<sup>56</sup> One of B&W's major objectives when entering the 1980s decade was to "obtain at least 12% share of market for KOOL by 1985."<sup>57</sup> In delineating steps to achieving that objective, B&W listed as one of the "key obstacle to overcome" that "KOOL must move into the health reassurance segment so that 45% of KOOL business will be in the perceived product safety arena by 1982".<sup>57</sup>

According to this B&W brand planning document in 1978 (estimated date), a prime Kool objective for 1979-1985 was also to "[p]rovide product safety reassurance while enhanc[ing] the satisfaction and refreshment perception of the appropriate KOOL styles, through the successful, national launch in 1979 of either: 1. Low-'tar' parent [or] 2. Repositioned KOOL Milds".<sup>57</sup> This emphasis on "product safety reassurance" points to the explicit role of menthol, like "low-tar"

and “mild”, in the company’s efforts to overcome consumers’ perception of the dangers of smoking.

Some internal documents suggest that such beliefs about the health benefits of mentholated cigarettes prevent potential quitters from quitting in favor of switching to a mentholated brand or style. For instance, a focus group study conducted for American Tobacco in 1969 tested, in part, perceptions of a new menthol product. It was observed that

Menthol smokers indicated that they smoked menthol cigarettes because they were "mild", "cooling", "refreshing", and "soothing to the throat". They considered non-menthol cigarettes to be irritating and-strong.... There were indications that the menthol smokers subconsciously perceived menthol cigarettes as being healthier. There was somewhat of a "health image" associated with menthol, related to its masking of the tobacco taste, and its association with medicine, colds, and sore throats.<sup>58</sup>

Similarly, a William Esty study for RJR in 1973 stated,

Generally when a respondent reported that he made a conscious decision to switch to a mentholated brand it was because of some problem, minor or major. For instance, many switched to mentholated cigarettes because of throat irritation, colds, coughs or chronic bronchitis. Sometimes respondents saw smoking a mentholated brand as the only alternative to giving up smoking altogether.<sup>59</sup>

Lorillard observed in 1972 that “[b]rand-switching has resulted in a 13% gain for Menthols which is larger than the 8% for Hi Fi [“high filtration”] brands, the only types gaining from claimed switching”, and cited a research participant’s explanation that “I started smoking Kools when I had a cold. It felt good so I kept on smoking them”.<sup>60</sup> Such beliefs about the protectiveness of menthol against colds probably prevented some of the smokers from quitting. In 1976, B&W noted that “evidence indicates that a pseudo-health image has accrued to mentholated cigarettes”.<sup>61</sup> Two years later, B&W explicitly acknowledged its Kool franchise “[r]ides on the connotation that menthol has health overtones”,<sup>62</sup> and that the Kool Super Lights line extension’s “menthol and tar delivery has synergistic therapeutic implications”.<sup>62</sup>

Following the 1952 Readers Digest article “Cancer by the Carton”,<sup>63</sup> which marked widespread and growing public awareness of the health hazards of smoking, a concurrent change in smoking rates and in cigarette style offerings took place. As B&W observed in a lengthy 1979 study of the “History and Key Trends in the US Cigarette Market”, “[t]he intense growth of Salem from 1957 thru [sic] 1961 coincided with another major development – the Tar Derby.”<sup>64</sup>

The study asserted,

[t]he Tar Derby was a major factor in Salem’s growth [following its introduction in 1956]. Salem was perceived to have more taste than competitive [non-menthol “low-tar”] offerings, which resulted in the coincident growth.... Newport, introduced in 1957, also grew during the Tar Derby.”<sup>64</sup>

Whereas “low-tar” cigarette brands aimed at health-concerned smokers are often derided as “hot air brands” with no taste,<sup>65</sup> menthol brands and styles are perceived as milder and lighter, and yet flavorful. An international qualitative study by PM in 1991 affirmed, “[t]he desire for a ‘lighter’ cigarette was an important underlying motive for switching to menthol cigarettes. In some cases, the ‘menthol’ was viewed as compensation for the ‘lack of taste’ of light cigarettes.”<sup>66</sup>

Due in part to the consumer perception that menthol is a solution to sore throats caused by smoking, some marketers have assumed menthol smokers were more health-oriented. In 1975, RJR stated “[m]enthol 85 smokers are more concerned about the alleged hazards of smoking than other smokers (except low flavor)”.<sup>67</sup> The evidence shown here suggests, however, that it may be more often the case that menthol smokers are convinced of the soothing throat sensation menthol imparts and are not necessarily likely to seek “light” or “low-tar” products. Noted a 1972 Lorillard study of the menthol market,

[w]hile health is an important reason for switching, health in terms of throat irritation is more important to Menthol, Lo Fi [low filtration] and taste conscious people.... Menthol smokers are attracted by taste with mildness appealing to the health oriented and with the lack of throat irritation appealing to the taste oriented.<sup>60</sup>

Although there may be some similarities between the “low-tar” market and the menthol market (such as seeking a milder, or potentially less harmful, cigarette), there are differences in the motivations behind brand and style choices of smokers in these two markets. Studying national smoking habits for American Tobacco in 1965, Batten, Barton, Durstine & Osborne, Inc. found the cigarette market “showed gains for Filters and Menthols and losses for Regulars and Kings. Despite having a larger portion of former smokers (quitters) than expected, Filters showed a net 2% gain. The 1% menthol gain came from a favorable switching flow with overcame a deficit of starters.”<sup>68</sup> In other words, following the 1964 Surgeon General’s report on smoking and health, those smokers who were not quitting outright were switching to filtered cigarettes, the precursor to “low-tar” cigarettes in the push to market ostensibly less hazardous cigarettes, or to menthol cigarettes. Whereas quitters in this study came disproportionately from the filters market, the report stated that “menthol quitting was average”,<sup>68</sup> suggesting people who switched to menthol did not progress to quitting.

This is consistent with Jay Faberman’s observation in his 1969 letter to Al Udow that “[o]nce the habit is perceived as bad, the smoker thus becomes susceptible [sic] to brand appeals that promise less tar or nicotine, or to products which make smoking seem more pleasant.”<sup>45</sup> Menthol appears to make smoking seem more pleasant to those who adopt menthol styles. Indeed, a 1990 RJR study of brand positioning asserted that “switching data shows that smokers do tend to stay with menthol taste once they have adopted a menthol brand”.<sup>69</sup> Although it is often observed that non-menthol smokers would not, or would only very reluctantly, smoke a menthol cigarette, and that the reverse is true for menthol smokers,<sup>44</sup> industry executives nevertheless recognize the potential for conversion of a dissatisfied smoker into a menthol smoker. M. Johnston analyzed quitting patterns among younger and older menthol and non-

menthol smokers and was puzzled by self-reports among menthol smokers regarding their quit attempts. He noted,

It is also possible that the larger proportion of menthol smokers who report having tried to quit is an artifact, for in the focus groups some people have reported that they switched to a menthol thinking that it would be easier to quit from something they did not really like, only to wind up liking menthol.<sup>70</sup>

In this case, Johnston found smokers switching to menthol in an attempt to quit ended up abandoning their desire to quit.

Health concerns may act as a driver of changes in smoking behavior and desire to quit, with switching to either “low-tar” or menthol as one response to health concerns. Nevertheless, menthol smokers tend to speak positively about their cigarettes more consistently than is seen in the “low-tar” market. B&W contracted Kapuler & Associates, Inc., to research consumers’ responses to advertising campaigns for Barclay, a “low-tar” brand, including a campaign with the tagline “The Pleasure is Back”.<sup>71</sup> Some respondents, the research discovered, “did not feel that they smoked for pleasure at all, but simply out of habit - perhaps out of guilt. They had an almost masochistic need not to enjoy smoking. These were mostly hi-fi smokers who wanted to quit and who did not want a more pleasurable cigarette which would make it harder to quit.”<sup>71</sup>

Similarly, Lorillard’s “situation analysis” in 1976 observed

Those who do not find taste an important variable indicate that they do not smoke primarily for sensory enjoyment but, rather, from habit, to relax, to have something in their hand, etc.; or they just do not give taste much thought ;or all they ask is that the taste be smooth, mild, non-irritating. Several (SHF [Lorillard’s term for “super high-filtration”] smokers disproportionately) say they do not particularly like the taste of any cigarette.<sup>47</sup>

Conversely, a Roper Organization study in 1979 stated about menthol smokers that they

are very positive about menthol cigarettes. They describe them as refreshing, satisfying, good tasting, mild tasting, less irritating, as having good tobacco flavor and as leaving less tobacco breath.... [Menthol smokers] are slightly less concerned than non-menthol

smokers about the health and social aspects of smoking. And they appear to enjoy smoking fully as much as non-menthol smokers.<sup>44</sup>

A 1980 focus group report for RJR's W. K. Neher pointed to even a kind of disdain for quitting among menthol smokers: "These menthol smokers were not aware of the tar level of cigarettes and they disliked 'light' brands because they were 'like smoking air' or 'for smokers who wanted to quit'."<sup>72</sup> Menthol smokers tend to be lighter smokers than their non-menthol counterparts, light smokers referring not to smokers of "low-tar" brands but those who smoked one half pack or less per day. The light smoker group, also called "casual smokers", contained a higher percentage of young adults, females, and more menthol cigarette smokers.<sup>73</sup> Such casual smokers typically felt "in control" of their smoking, unlike "guilt-laden" smokers who want to quit but feel they can't, and often switch of the "hot air" brands.

[t]hey said that they smoked when they wanted a cigarette and at this time they would seek situations where they could enjoy cigarettes and avoid conflict.... They said that they wanted a cigarette for enjoyment or taste not because of "habit" or "need." These smokers viewed themselves as being in control . This sense of control helped these smokers justify their smoking and gave them some positive feelings.<sup>74</sup>

This can be contrasted this with studies PM conducted in the mid-1980s, in which they divided smokers into different segments based on their attitudes about smoking.<sup>75</sup> The group with the most negative views about smoking were called "potential quitters",<sup>75</sup> then later "Guilt Laden" smokers.<sup>75,76</sup> Potential quitters did not have positive attitudes about smoking or about the image of smokers. They were embarrassed about their smoking and uncomfortable smoking around nonsmokers, and they were admittedly trying to quit or cut down. Contrary to the experience of "guilt laden" smokers, the subjective perception of a pleasurable menthol smoking experience appears to help menthol smokers feel better about their smoking, more comfortable smoking around nonsmokers, and less in need of quitting.

*Social unacceptability of smoking.* Another motivation for quitting is the social unacceptability of smoking. Booz, Allen, & Hamilton's 1990 report to RJR stated,

Recent RJR focus group research indicates smokers are feeling Increasing pressure from non-smokers and are Interested in products to make the smoking experience more enjoyable by reducing smoker/non-smoker tension.... Data also indicates [sic] smokers may be concerned about the externally perceived effects of smoking and resulting pressures. 85% believe smoking can be very bothersome to some people. 75% think "a lot of people view smoking as a-negative habit." Almost 50% believe "non-smokers would complain less If smoke were reduced". 50-80% agree with various statements that the smell of smoke has negative effects on hair, clothes, cars, etc.<sup>37</sup>

Although this report did not refer specifically to menthol, it is clear from internal documents that menthol smokers tend to think of menthol as a solution not only to the harshness of smoking but also to the social and/or cosmetic negatives of cigarette smoke. Market research on menthol smokers conducted in Japan for PM in 1991 revealed that one major objection to smoking around others that respondents in this study cited was

- The smell. (All Groups)
  - The smell itself is unpleasant./The smell gets in your hair and clothes (frequent complaint heard from women)./It causes bad breath.<sup>66</sup>

Marketing Decision Research (Pacific) Ltd. found menthol was considered a solution to this problem in a 1992 Hong Kong study for PM. The report stated that

Overall, menthol cigarettes are seen to be lighter in strength [more like "light" cigarettes] and cigarette taste than non-menthol and full-flavoured cigarettes. The "cooling" and "refreshing" abilities of menthol have the following advantages:

- make smokers feel comfortable
- less easy to cause throat discomfort
- won't give bad breath
- has no/less cigarette smell & won't stink the environment<sup>77</sup>

Addressing social acceptability concerns, RJR noted in a 1990 brand positioning report that for the Salem and Newport brands, "menthol [served] to lower risk of offending others with odor/smoke",<sup>69</sup> and that Salem smokers in particular endorsed the following items:

I'm imposing



Clothes smell bad  
 Want less offensive cig  
 People object  
 Breath mints  
 Worry odor<sup>69</sup>

The report observed,

- Another potential example of recent success among “menthol” brands may be Horizon
  - Horizon is not a menthol-based proposition; it is positioned much more broadly to address social concerns about smoking
  - Yet 40% of its franchise in test market smokes the menthol styles, an index of 133
  - Menthol may support Horizon's positioning as a brand with a solution to social concerns<sup>69</sup>

Though often associated with young women, this social concern is not restricted to women. RJR determined in a 1972 study of “Personality Traits of Menthol Smokers” that both women and men who smoked menthol rated the trait “courteous and cooperative” higher than their non-menthol smoking counterparts.<sup>78</sup> Interestingly, RJR’s brand Horizon, first introduced as Chelsea<sup>79-81</sup> was advertised explicitly as a cigarette with “improved lingering aroma via delivery of a pleasant aroma from the lit end”,<sup>81</sup> but was rejected because mentioning odor served only to emphasize the problem. A 1991 report of focus group testing of Horizon for RJR revealed that [t]elling smokers that Horizon will make them and/or their surroundings smell better implies they currently smell unpleasant and offensive. Smokers may privately acknowledge and even openly admit this, but... may prefer not to smoke a cigarette that blatantly brands itself as a solution to an odor problem.<sup>82</sup>

Conversely, menthol, not advertized overtly as a solution to malodorous cigarette smoke, appears to be more readily embraced by menthol smokers who express cosmetic concerns as more socially acceptable to be around relative to non-mentholated smoke. As the Roper Organization’s 1979 report on smokers’ habits pointed out, “[m]enthol smokers are slightly less

inclined than non-menthol smokers to feel uncomfortable about smoking around others.”<sup>44</sup> As the social unacceptability of smoking is a motivator of quitting behavior, the perception of menthol as more socially acceptable or less offensive to others may indirectly contribute to a lack of motivation to quit smoking among menthol smokers.

#### Socio-demographic correlates of both menthol usage and cessation patterns

*Menthol appeals to some socio-demographic groups who are also known to have difficulty initiating quitting or staying quit, including women, lower income smokers, and African Americans. Although it is not clear why there is substantial overlap between the overall menthol profile (younger, non-white, female, and low income) and socio-demographic variables that predict difficulty in quitting or staying quit, it appears that tobacco companies took an interest in this overlap.*

Menthol appeals to some socio-demographic groups who are also known to have difficulty initiating quitting or staying quit, including women, lower income smokers, and African Americans. Although it is unclear what role menthol specifically may play in this, tobacco industry documents reveal an awareness of and an interest in these associations of menthol with specific socio-demographic groups as loyal, continuing consumers.

There is no one monolithic menthol user profile, but rather brand-specific profiles that differ across the stand-alone menthol brands. Overall, however, the menthol demographic is non-White, younger, female, and lower income.<sup>83</sup> Although a clear explanation for why African Americans are so heavily overrepresented in the menthol market has not been agreed upon, it is important to note that the possibility of a physiological mechanism specific to African Americans has been presented inside the tobacco industry. As stated in the 1979 Roper Organization study conducted for PM,

One interesting difference showed up in the answers of white non-menthol smokers vs . black non-menthol smokers. Whites were more inclined than blacks to say menthols affected them physically. We wonder if this could possibly indicate a physiological difference that has some bearing on why more blacks than whites smoke menthols?<sup>44</sup>

PM's Myron Johnston wrote in 1981 of his "suspicion that demographic and socio-economic variables were confounding the relationship between tar and nicotine deliveries and average daily consumption".<sup>84</sup> The demographic and socio-economic variables he examined matched closely to the menthol market socio-demographics. He observed that

[i]n many cases the demographic variables proved better predictors of cigarette consumption than tar and nicotine. This was particularly true of blacks, among whom the socio-economic characteristics were the best predictors in seven of the ten cases, and income the best predictor in four of those cases.<sup>84</sup>

For the smoking population in general, Johnston stated that "at each income level, there is a tendency for consumption to be lower with increasing levels of educational attainment", and that "females find it harder to quit smoking than males".<sup>84</sup> Similarly, as R. E. Thornton of BAT observed in his 1976 study of the smoking behavior of British women,

there is some evidence that women are more highly motivated to smoke than men and find it harder to quit smoking. In terms of brands which are not specifically aimed at women the following statement about women's reaction to new concepts has been attributed to J . Bowling, Group Vice President of Philip Morris. "The ladies have led every major cigarette trend in the past 15 years. Our studies show that they were the first to embrace king size cigarettes, menthol, charcoal and recessed filters".<sup>39</sup>

Surprised by a seeming anomaly in his data suggesting some female smokers had higher incidences of quitting than men, Thornton postulated that the oddity "is most probably explicable in terms of a complex interaction between quitting habits and social class: subjects of the higher social classes being much more successful at quitting than those of lower social classes."<sup>39</sup> The 1981 analysis by M. J. Weaver, also of BAT, on "cigarette smoking, health, and dissonance", concurred with Thornton's observations. Weaver wrote of successful quitters, "[l]ooking at the overall profile of ex-manufactured cigarette smokers, it is male dominated (65% men v 35%

women) and biased towards the older age groups and higher social class groups.”<sup>85</sup> This description is opposite that of the overall menthol socio-demographics.

Some data suggest, however, that younger people quit more than older, established smokers do. Although Weaver’s report showed the ex-smokers groups biased toward older ages, the report also stated, “[q]uitters within the last two years were also more likely to be younger...53% were aged 16-44 against 37% of the total sample”.<sup>85</sup> Similarly, a PM summary of their study of quitting, compiled in 1988, stated that “[d]ue to an older smoker profile, RJR has below average representation among... quitter groups. This appears largely a function of Doral and Winston.”<sup>86</sup> However, the other key brands that contradicted this trend were two of the three most popular stand-alone menthol brands; the report showed

- Newport was the only "younger" brand underrepresented among successful quitters.
- Kool, like Newport, was also underrepresented among successful quitters.<sup>86</sup>

A 1978 study of ex-smokers by PM’s F. J. Ryan found similar patterns of age and quitting, and neatly explained the findings as follows:

Menthol filter smokers have a median age of about 34, and nonmenthol filter smokers a median of about 37. Looking at the people who quit within the past year, the average menthol filter quitter was about 34 at quitting, and the average nonmenthol filter quitter was about 37.

As noted above, the most recent “quitters” (those who quit within 1 to 3 months), appear to be younger than those who quit some time ago. However, scanning the age at time of quitting data for those who quit a year or more ago, it is difficult to interpret the recent numbers in terms of a trend. We think it more likely that the initial quit rate for younger smokers is about the same from year to year, but that their long-term success rate is poorer than the success rate for older smokers. Thus the future recidivists’ presence in the group of recent quitters means the average age of recent quitters is usually relatively low compared to the average age of people who have abstained long enough to be truly considered former smokers.<sup>87</sup>

In other words, Ryan surmised that although menthol quitters were younger than non-menthol quitters, these younger quitters were more likely to relapse and not experience long-term abstinence success. Although it is not clear why there is substantial overlap between the overall

menthol profile (younger, non-white, female, and low income) and socio-demographic variables that predict difficulty in quitting or staying quit, it does seem clear from the internal documents that tobacco companies took an interest in this overlap.

### **Discussion**

Menthol's anesthetic, soothing, and cooling qualities mask the short-term negatives of smoking such as throat burn and cough. For smokers initiating with menthol, they may not experience the negatives of smoking initiation that could otherwise put them off of smoking and prevent them from progressing as smokers. For smokers who do experience the negatives of smoking and seek relief, they may consider quitting as the only good option. Switching to menthol, however, may provide superficial physical relief as well as psychological assurance against concerns about health that would otherwise motivate smokers to quit. Regardless of effects on smoking topography menthol may have, the cooling and anesthetic effects of menthol may advance a smoker from experimental or light smoking to established smoking rather than to quitting in the absence of these effects. The evidence demonstrating smokers' switching from non-menthol to menthol cigarettes when they have a cold or sore throat points to a presumption of therapeutic or health-protective effects of menthol, effects that lead smokers to believe it is unnecessary to quit smoking in order to protect one's health. Tobacco industry executives acknowledged the health reassurances such beliefs about menthol imply and have marketed menthol with both explicit and implicit health messages.<sup>88</sup> As concern for health is a motivator of quitting, the implications of health protection and health reassurance that accompany menthol make menthol cigarettes a barrier to quitting motivation.

Menthol smokers experience their cigarettes as milder than "regular" cigarettes (with exceptions such as Kool brand smokers who are accustomed to high levels of menthol). Menthol

smokers overlap with health-concerned “low-tar” smokers in their uptake of “milder” cigarettes, and the subjective experience of the soothing and cooling of menthol contributes to a perception of menthol as less harmful. Unlike “low-tar” smokers, however, menthol smokers tend to derive more sensory enjoyment from their brands, feel less guilt about smoking, and have less desire to quit. It is well established that “low-tar” cigarettes do not aid in cessation among people who wish to quit; not only it is likely that menthol does not aid in cessation, but evidence from the internal documents also shows menthol is associated with decreased desire to quit.

In addition to health concerns, the growing social unacceptability of smoking in general has prompted quitting. Menthol smokers, particularly women, are attracted to the minty flavor and aroma of the style and perceive the smoke from menthol cigarettes to be less offensive to others. These smokers believe menthol cigarettes to be more socially acceptable than non-menthol cigarettes, a perception that lessens the impact of smoking denormalization on quitting motivation.

Menthol’s superficial physical effects (subjective cooling and soothing) contribute to its ability to mislead consumers and potential consumers regarding the relative safety of menthol products. This, along with its fresh or confectionary flavors and its perceived social acceptability, demotivate quitting in smokers who may otherwise quit, and to appeal to uninitiated potential new consumers and younger consumers.

## References

1. Mitka M. FDA exercises new authority to regulate tobacco products, but some limits remain. *JAMA*. 2009;302(19):2078-81.
2. Ahijevych K, Garrett BE. Menthol pharmacology and its potential impact on cigarette smoking behavior. *Nicotine Tob Res*. 2004;6(Suppl 1):S17-28.
3. Covington & Burling. Summary of data on menthol. 1986 1986. Brown & Williamson. <http://legacy.library.ucsf.edu/tid/isn33f00>. <http://legacy.library.ucsf.edu/tid/isn33f00>
4. Giovino GA, Sidney S, Gfroerer JC, O'Malley PM, Allen JA, Richter PA, Cumming KM. Epidemiology of menthol cigarette use. *Nicotine Tob Res*. 2004;6(Suppl 1):S67-81.
5. Federal Trade Commission. Cigarette report for 2006. . <http://www.ftc.gov/os/2009/08/090812cigarettereport.pdf>; 2009.
6. Substance Abuse and Mental Health Services Administration Office of Applied Studies. The nsduh report: Use of menthol cigarettes. Rockville, MD.; Nov. 19, 2009.
7. Hyland A, Garten S, Giovino GA, Cummings KM. Mentholated cigarettes and smoking cessation: Findings from commit, community intervention trial for smoking cessation. *Tob Control*. 2002;11(2):135-9.
8. Fu SA, Okuyemi KA, Partin ME, Ahluwalia JA, Nelson DB, Clothier BA, Joseph AM. Menthol cigarettes and smoking cessation during an aided quit attempt. *Nicotine Tob Res*. 2008;10(3):457-62.
9. Werley MS, Coggins CR, Lee PN. Possible effects on smokers of cigarette mentholation: A review of the evidence relating to key research questions. *Regul Toxicol Pharmacol*. 2007;47(2):189-203.
10. Harris KJ, Okuyemi KS, Catley D, Mayo MS, Ge B, Ahluwalia JS. Predictors of smoking cessation among african-americans enrolled in a randomized controlled trial of bupropion. *Prev Med*. 2004;38(4):498-502.
11. Okuyemi KS, Ebersole-Robinson M, Nazir N, Ahluwalia JS. African-american menthol and nonmenthol smokers: Differences in smoking and cessation experiences. *J Natl Med Assoc*. 2004;96(9):1208-11.
12. Pletcher MJ, Hulley BJ, Houston T, Kiefe CI, Benowitz N, Sidney S. Menthol cigarettes, smoking cessation, atherosclerosis, and pulmonary function: The coronary artery risk development in young adults (cardia) study. *Arch Intern Med*. 2006;166(17):1915-22.
13. Okuyemi KS, Faseru B, Sanderson Cox L, Bronars CA, Ahluwalia JS. Relationship between menthol cigarettes and smoking cessation among african american light smokers. *Addiction*. 2007;102(12):1979-86.
14. Okuyemi KS, Ahluwalia JS, Ebersole-Robinson M, Catley D, Mayo MS, Resnicow K. Does menthol attenuate the effect of bupropion among african american smokers? *Addiction*. 2003;98(10):1387-93.
15. Gundersen DA, Delnevo CD, Wackowski O. Exploring the relationship between race/ethnicity, menthol smoking, and cessation, in a nationally representative sample of adults. *Prev Med*. 2009;49(6):553-7.
16. Gandhi KK, Foulds J, Steinberg MB, Lu SE, Williams JM. Lower quit rates among african american and latino menthol cigarette smokers at a tobacco treatment clinic. *Int J Clin Pract*. 2009;63(3):360-7.
17. Allen Jr B, Unger JB. Sociocultural correlates of menthol cigarette smoking among adult african americans in los angeles. *Nicotine Tob Res*. 2007;9(4):447-51.

18. Orleans CT, Schoenbach VJ, Salmon MA, Strecher VJ, Kalsbeek W, Quade D, Brooks EF, Konrad TR, Blackmon C, Watts CD. A survey of smoking and quitting patterns among black americans. *Am J Public Health.* 1989;79(2):176-81.
19. Unger JB, Allen Jr B, Leonard E, Wenten M, Cruz TB. Menthol and non-menthol cigarette use among black smokers in southern california. *Nicotine Tob Res.* 2010;12(4):398-407.
20. Richter P, Beistle D, Pederson L, O'Hegarty M. Small-group discussions on menthol cigarettes: Listening to adult african american smokers in atlanta, georgia. *Ethn Health.* 2008;13(2):171-82.
21. Ahijevych K, Parsley LA. Smoke constituent exposure and stage of change in black and white women cigarette smokers. *Addict Behav.* 1999;24(1):115-20.
22. Kreslake JM, Wayne GF, Connolly GN. The menthol smoker; tobacco industry research on consumer sensory perception of menthol cigarettes and its role in smoking behavior. *Nicotine Tob Res.* 2008;10(4):705-15.
23. Anderson SJ, Pollay RW, Ling PL. Taking advantage of lax advertising regulation in the USA and canada: Reassuring and distracting health-concerned smokers. *Soc Sci Med.* 2006;63(8):1973-85.
24. Pollay RW, Dewhirst T. The dark side of marketing seemingly "Light" Cigarettes: Successful images and failed fact. *Tob Control.* 2002;11(Suppl 1):i18-31.
25. Rose JE, Behm FM. Extinguishing the rewarding value of smoke cues: Pharmacological and behavioral treatments. *Nicotine Tob Res.* 2004;6(3):523-32.
26. Malone R, Balbach E. Tobacco industry documents: Treasure trove or quagmire? *Tob Control.* 2000;9(3):334-8.
27. Miles M, Huberman A. *Qualitative data analysis: An expanded sourcebook*, 2nd ed. Thousand Oaks, CA: Sage Publications, Inc.; 1994.
28. Bero L. Implications of the tobacco industry documents for public health and policy. *Annu Rev Public Health.* 2003;24(1):267-88.
29. Binns R. Visit to BIBRA: 25th February 1974. 1974. British American Tobacco. <http://legacy.library.ucsf.edu/tid/hjm10a99>.
30. Tinsley M. Brown & williamson tobacco corp. Subjective coding project - substance glossary. 1989. UCSF B&W. <http://legacy.library.ucsf.edu/tid/qyc72d00>.
31. Lorillard. Unfair or deceptive advertising and labeling of cigarettes in relation to the health hazards of smoking. 1964. Lorillard. <http://legacy.library.ucsf.edu/tid/keb00e00>. (estimated date).
32. Brown & Williamson. B & W. 1978. RJ Reynolds. <http://legacy.library.ucsf.edu/tid/cwt76a00>.
33. Lorillard. An exploratory study - new brands development. 1974. Lorillard. <http://legacy.library.ucsf.edu/tid/cmy09c00>.
34. ADI Research Inc. B&w cigarette smokers study. 1984. Brown & Williamson. <http://legacy.library.ucsf.edu/tid/nwo83f00>.
35. RJ Reynolds. Brand marketing plan now. 1991. RJ Reynolds. <http://legacy.library.ucsf.edu/tid/evl56a00>.
36. Udow A. Cipollone memo to r.N. Saleeby from a. Udow consumer behavior - cigarette smoking third quarter 680000. 1987. Philip Morris. <http://legacy.library.ucsf.edu/tid/kff34e00> (estimated date).



37. Booz Allen & Hamilton Inc. Project. Content. Industry volume. 1990. RJ Reynolds. <http://legacy.library.ucsf.edu/tid/ijr92d00>.
38. RJ Reynolds. Project gs consumer qualitative study (mdd #80-2413). Executive summary. 1980. RJ Reynolds. <http://legacy.library.ucsf.edu/tid/dvu49d00>.
39. Thornton RE. The smoking behaviour of women: Report no rd 1410 restricted. 1976. British American Tobacco. <http://legacy.library.ucsf.edu/tid/fmr30a99>.
40. Dunn WL, Martin PG. A field test of an 85 mm 15 mg control profile cigarette (x6d2tj) vs. An 85 mm 15 mg conventional cigarette (x6d2ti) including an evaluation of the control profile concept 4009 - c.P. Cigarettes. 1972. Philip Morris. <http://legacy.library.ucsf.edu/tid/ott97e00>.
41. Aaron H. (no title). 00 Jan 1960. Lorillard. <http://legacy.library.ucsf.edu/tid/sdx64c00>
42. Leo Burnett. Review of new menthol brands. 1995. Philip Morris. <http://legacy.library.ucsf.edu/tid/gaa37c00>.
43. Batten Barton Durstine & Osborne Inc. Focused group interviews conducted in new york and minneapolis on tennysen cigarettes. 1969. American Tobacco. <http://legacy.library.ucsf.edu/tid/boo21a00>.
44. Roper Organization. A study of smokers' habits and attitudes with special emphasis on low tar and menthol cigarettes volume i. 1979. Research. <http://legacy.library.ucsf.edu/tid/zvt46b00>.
45. Faberman J. Smoking habits. 1969. Research. <http://legacy.library.ucsf.edu/tid/byt46b00>.
46. Landis Group. Qualitative report for philip morris on menthol cigarettes. 1992. Research. <http://legacy.library.ucsf.edu/tid/nri76b00>.
47. Nowland Organization Inc. Shf cigarette marketplace opportunities search and situation analysis. 1976. Research. <http://legacy.library.ucsf.edu/tid/fcs46b00>.
48. Oday P. Monitor reports related to shf market. 1975. Lorillard. <http://legacy.library.ucsf.edu/tid/prd20e00>.
49. William Esty. Salem cigarettes. Attitudes and behavior with respect to mentholated cigarettes. 1973. RJ Reynolds. <http://legacy.library.ucsf.edu/tid/wad39d00>.
50. Sherman Group. Insights into newport. An exploratory study in brand perceptions. 1976. RJ Reynolds. <http://legacy.library.ucsf.edu/tid/fcb49d00>.
51. Lorillard. The menthol cigarette market - a summary. 1972. Research. <http://legacy.library.ucsf.edu/tid/ykr46b00>.
52. Brown & Williamson. -- no title --. No Date 0000. Brown & Williamson. <http://legacy.library.ucsf.edu/tid/pol90f00>.
53. Cunningham and Walsh. Kool: 1933 - 1980 - a retrospective view of kool - book i: The text. 1980. Research. <http://legacy.library.ucsf.edu/tid/nso56b00>.
54. Bernstein A. Brown & williamson tobacco corporation, evaluation of major brands, 1954 - 1964. 1954. American Tobacco. <http://legacy.library.ucsf.edu/tid/bvv25f00>.
55. Creative Research Group Limited. Project viking volume iii: Product issues - february - march, 1986. 1987. Research. . <http://legacy.library.ucsf.edu/tid/poa76b00>.
56. Lorillard. Kent menthol 100's. 1973. Lorillard. <http://legacy.library.ucsf.edu/tid/dud20e00>.
57. Lorillard. Kool family utopian objectives 1979-1985. 1978. Research. <http://legacy.library.ucsf.edu/tid/xjm66b00>.

58. Batten Barton Durstine & Osborn Inc. Focused group interviews conducted in New York and Minneapolis on Tennyson cigarettes. 1969. American Tobacco.  
<http://legacy.library.ucsf.edu/tid/boo21a00>.
59. William Esty Inc. Salem cigarettes. Attitudes and behavior with respect to mentholated cigarettes. 1973. RJ Reynolds. <http://legacy.library.ucsf.edu/tid/wad39d00>.
60. Lorillard. The menthol cigarette market - a summary. 1972. Research.  
<http://legacy.library.ucsf.edu/tid/yrm76b00>. <http://legacy.library.ucsf.edu/tid/yrm76b00>.
61. Brown & Williamson. Low tar longs project creative agency assignment. 1976. Brown & Williamson. <http://legacy.library.ucsf.edu/tid/jsu60f00>.
62. Johnson R. -- no title. 1978. Brown & Williamson.  
<http://legacy.library.ucsf.edu/tid/wde21f00>.
63. Norr R. Cancer by the carton. 1952. Brown & Williamson.  
<http://legacy.library.ucsf.edu/tid/kap01f00>.
64. Brown & Williamson. History and key trends in the u.S. Cigarette market. 1979. Research. <http://legacy.library.ucsf.edu/tid/rzp46b00>.
65. RJ Reynolds. Vantage history. I. Background. I. Background: 1970 (70000). 1981. RJ Reynolds. <http://legacy.library.ucsf.edu/tid/pru76a00>.
66. ASI Research Inc. Qualitative research on menthol / nonmenthol smokers. 1991. Research. <http://legacy.library.ucsf.edu/tid/bhi86b00>.
67. RJ Reynolds. Menthol category review. 1975. RJ Reynolds.  
<http://legacy.library.ucsf.edu/tid/lfy49d00>.
68. Batten Barton Durstine & Osborne Inc. 1965 lucky strike franchise national smoking habits study. 1965. Research. <http://legacy.library.ucsf.edu/tid/nsg56b00>.
69. RJ Reynolds. Brand positioning. 1990. Research.  
<http://legacy.library.ucsf.edu/tid/df176b00>.
70. Johnston M. The implications of those strange happenings in the menthol market. 1985. Philip Morris. <http://legacy.library.ucsf.edu/tid/php93e00>.
71. Kapuler & Associates Inc. Consumers reactions to the barclay advertising campaign - a qualitative study. 1981. Brown & Williamson. <http://legacy.library.ucsf.edu/tid/nth01f00>.
72. McKee M. Newport exploratory focus groups (mdd #80-0105). 1980. RJ Reynolds.  
<http://legacy.library.ucsf.edu/tid/drc69d00>.
73. Gaspar A. Social acceptability. 1978. RJ Reynolds.  
<http://legacy.library.ucsf.edu/tid/umj77c00>.
74. McKee MK. Social acceptability of smoking. 1982. RJ Reynolds.  
<http://legacy.library.ucsf.edu/tid/obl24d00>.
75. Philip Morris. No title. 1979. Philip Morris. <http://legacy.library.ucsf.edu/tid/lqr22e00>.
76. Burson-Marstellar. Social acceptability of smoking and of smokers - a strategic approach for philip morris international 1991. Philip Morris. <http://legacy.library.ucsf.edu/tid/mtq98e00>.
77. Marketing Decision Research (Pacific) Ltd. Project 'fresh start' - a report. 1992. Philip Morris. <http://legacy.library.ucsf.edu/tid/asw81f00>. (estimated date).
78. Hall Jr L. Personality traits of menthol smokers. 1972. RJ Reynolds.  
<http://legacy.library.ucsf.edu/tid/clj18c00>
79. Robinson A. Review of qualitative and quantitative research on Chelsea and Horizon. 1992. RJ Reynolds. <http://legacy.library.ucsf.edu/tid/rcn83d00>.
80. Deines W. Cigarette sidestream. 1990. British American Tobacco.  
<http://legacy.library.ucsf.edu/tid/tms00a99>.

81. Young Rubicam. Horizon strategic marketing review. 1990. RJ Reynolds. <http://legacy.library.ucsf.edu/tid/yzt03a00>.
82. Mindy Goldberg Associates. Overview of strategic positioning issues for horizon. 1991. RJ Reynolds. <http://legacy.library.ucsf.edu/tid/idu03a00>.
83. Philip Morris. The declining menthol market. 1986. Philip Morris. <http://legacy.library.ucsf.edu/tid/jhv55e00> (estimated date).
84. Johnston M. Average daily cigarette consumption by delivery level and measures of socio-economic status. 1981. Philip Morris. <http://legacy.library.ucsf.edu/tid/hqq11b00>.
85. Weaver M. Cigarette smoking, health and dissonance (project libra): Iv. Further analysis, conclusions and recommendations. 1981. Research. <http://legacy.library.ucsf.edu/tid/kbk46b00>.
86. Schwartz A. Quitting. 1988. Research. <http://legacy.library.ucsf.edu/tid/sov56b00>.
87. Ryan F. 1600 - smoker psychology exit brand cigarettes: A study of ex-smokers. 1978. Research. <http://legacy.library.ucsf.edu/tid/ksj46b00>.
88. Anderson SJ. Marketing of menthol cigarettes and consumer perceptions: A white paper; 2010.

### Appendix

Appendix: Legacy Tobacco Documents Library search terms and results.

<b>Legacy Tobacco Documents Library Search Terms and Results</b>			
Search terms: initial searches	# of Results	# of docs screened	# of docs retrieved
Menthol AND quit*	74,980	350	95
Menthol AND cessation	9,321	200	33
Menthol AND relaps*	2,042	100	9
Menthol AND motivat*	25,615	300	66
Menthol AND research	322,175	200	28
Menthol AND qualitative	38,329	250	36
Menthol AND quantitative	35,389	100	9
Menthol AND report AND quit*	56,260	100	3
Search terms: iterative searches	# of Results	# of docs screened	# of docs retrieved
Newport AND quit*	38,752	250	53
Salem AND quit*	82,696	200	8
Kool AND quit*	41,869	70	1
Menthol AND black AND quit*	28,724	200	15
Menthol AND African* AND quit*	5,493	120	7
Menthol AND women AND quit*	28,957	200	36
Menthol AND females AND quit*	18,020	250	26
Menthol AND Asian* AND quit*	4,927	100	6
Menthol AND “young adult smoker” AND quit*	844	170	8
Menthol AND YAS AND quit*	2,310	100	6
Menthol AND YAMS AND quit*	426	100	1
Menthol AND YAFS AND quit*	139	139	2
Menthol AND psychographic* and quit*	1,845	100	5
Menthol AND quit* AND sensation	6,616	100	4
Menthol AND quit* AND	671	100	4

“peer acceptance”			
Menthol AND quit* AND offend	1,094	100	6
Menthol AND quit* AND smell	8,240	100	7
Menthol AND “personal concerns”	773	150	11
Menthol AND “social concerns”	1,505	60	2
Menthol AND “health concerns”	6,016	50	1
“Project LIBRA” AND menthol	87	87	2
“Project GS” AND menthol	1,048	100	8
“Project UT” AND menthol	516	100	3
Menthol AND Udow AND quit*	441	80	5
Menthol AND “Booz Allen & Hamilton” AND quit*	90	90	3

*Notes:* 1. An asterisk (\*) indicates a “wildcard” search, such that the stem of the word indicated will yield results containing that stem. For instance, “menthol\*” will yield “menthol”, “mentholated”, “mentholation”, etc.

2. A string of words in quotation marks (“”) indicates a “phrase” search, such that the string included in order within the quotation marks will be searched. For instance, “consumer perception” as a single phrase will be searched.