

Cigarette pack design and perceptions of risk among UK adults and youth

David Hammond¹, Martin Dockrell², Deborah Arnott², Alex Lee¹, Ann McNeill³

Background: It is illegal in the EU for tobacco packaging to suggest that some cigarettes are safer than others. This study examined consumer perceptions of cigarette packs in the UK, including perceptions of 'plain packaging', in which colour and other design elements are removed, whilst retaining the brand name. **Methods:** 516 adult smokers and 806 youth aged 11–17 participated in an online survey. Participants were asked to compare pairs of cigarette packs on five measures: taste, tar delivery, health risk, attractiveness and either ease of quitting (adult smokers) or brand they would choose if trying smoking (youth). **Results:** Adults and youth were significantly more likely to rate packs with the terms 'smooth', 'silver' and 'gold' as lower tar, lower health risk and either easier to quit smoking (adults) or their choice of pack if trying smoking (youth). For example, more than half of adults and youth reported that brands labelled as 'smooth' were less harmful compared with the 'regular' variety. The colour of packs was also associated with perceptions of risk and brand appeal: compared with Marlboro packs with a red logo, Marlboro packs with a gold logo were rated as lower health risk by 53% and easier to quit by 31% of adult smokers. Plain packs significantly reduced false beliefs about health risk and ease of quitting, and were rated as significantly less attractive and appealing to youth for trying smoking. **Conclusions:** Current regulations have failed to remove potentially misleading information from tobacco packaging. Removing colours from packs (plain packaging), as well as terms such as 'smooth' 'gold' and 'silver' would significantly reduce false beliefs and increase compliance with existing legislation.

Keywords: health policy, plain packaging, tobacco, tobacco marketing.

Introduction

Tobacco marketing played a critical role in the dramatic rise and gradual decline of smoking in the 20th century.^{1,2} Packaging has served as an integral component of this marketing strategy.^{3–7} The pack provides a direct link to the consumer and establishes the brand imagery upon which other forms of marketing are built.^{5,6} The marketing value of tobacco packs has increased as traditional forms of advertising and promotion have become restricted.^{8,9} As Philip Morris executives have noted: 'Our final communication vehicle with our smoker is the pack itself. In the absence of any other marketing messages, our packaging... is the sole communicator of our brand essence.'¹⁰

The primary role of tobacco packaging is to promote brand appeal, particularly to youth and young adults, the period during which smoking behaviour is established.^{5,6,11,12} Tobacco packaging has also been used to reassure consumers about the risks of smoking. A central feature of this marketing strategy has been to promote the perception that some cigarettes are less hazardous than others, most notably through the use of brand descriptors such as 'light', 'mild' and 'low tar'.^{13,14} Although 'light' and 'mild' cigarette brands typically generate lower tar and nicotine numbers under machine testing (which does not accurately reflect human smoking behaviour) and may taste 'lighter' due to their filter designs, smokers 'compensate' for these differences by either increasing the number of puffs per cigarette or by increasing

the number of cigarettes they smoke.¹⁵ As a result, the apparent health benefits of these cigarettes are illusory: 'light', 'mild' and 'low tar' brands are no less harmful than 'regular' or 'higher tar' cigarettes.¹⁵ Nevertheless, considerable proportions of adult smokers and youth continue to believe that 'light', 'mild' and 'low tar' cigarette brands lower health risk and are less addictive than 'regular' or 'full flavour' brands.^{13,16–18,19} Indeed, many health-concerned smokers report switching to these brands as an alternative to quitting.^{15,19}

Perceptions of risk can also be influenced by the brand imagery and colour of packs.^{5,6} Tobacco industry documents suggest that light grey and blue packs are often perceived by smokers as 'lighter' and 'milder' than brands in red packs.^{6,20} Lighter shades of the same colour, as well as the proportion of white space on the pack can also be used to manipulate consumer perceptions of risk.^{6,21}

In 2003, the European Union (EU) prohibited manufacturers from using the terms 'low-tar', 'light', 'ultra-light' and 'mild', on the basis that they implied that a particular tobacco product is less harmful than others. To date, these terms have been prohibited in approximately 50 countries throughout the world as part of the WHO Framework Convention on Tobacco Control (FCTC)—the world's first international public health treaty.²² However, recent evidence from Canada, the UK and Australia suggests that prohibiting 'light' and 'mild' terms may be insufficient to significantly reduce false beliefs about the risks of different cigarette brands.²³ One potential explanation for these findings is the wide range of other descriptors that remain in use, including words such as 'smooth'. The persistence of false beliefs may also be due to other promotional aspects of the pack, including brand imagery and colour. For example, packs with a standardized appearance that only feature the name of brands on a plain background without brand imagery have been shown to reduce the attractiveness of packs and to increase the salience of health warnings.^{24–26}

1 Department of Health Studies & Gerontology, University of Waterloo, Waterloo, Ontario, Canada

2 Action on Smoking and Health, London, UK

3 School of Community Health Sciences, Division of Epidemiology & Public Health, University of Nottingham

Correspondence: David Hammond, Department of Health Studies & Gerontology, University of Waterloo, 200 University Avenue West, Waterloo, Ontario, N2L 3G1, Canada, tel: +1 519 888 4567 36462, fax: +1 519 886 6424, e-mail: dhammond@uwaterloo.ca

The current study explored perceptions of leading cigarette brands in the UK among youth and adult smokers. In particular, the study sought to examine the extent to which participants perceived differences based on viewing pictures of cigarette packs with respect to the taste, tar level, health risk, attractiveness and ease of quitting (for adults) or brand of choice if they were to try smoking (for youth). The study also examined the effect of plain packaging, in which colour and brand imagery were removed.

Methods

Protocol

Respondents were recruited from a proprietary consumer panel managed by the UK survey firm, 'YouGov', which consisted of over 185 000 individuals. Adults who reported at least one cigarette in the past month were eligible. Panel members with youth <18 years of age were asked by email if they were willing to allow their youth to participate. After providing consent, participants completed a 15-min survey asking about their opinions of different cigarette brands. Adult smokers were given £1.50 for participating in the study, and parents/guardians of the youth sample received £3. The survey was conducted between June and August 2008.

Measures

An initial set of questions were asked about smoking status, intention to quit smoking, cigarettes per day and susceptibility to smoking among youth using validated measures.²⁷ Participants then viewed a series of cigarette packs presented in pairs and before answering five questions: (i) 'Which brand do you think would have the *most tar* if you were to smoke it?'; (ii) 'Which brand do you think would have the *smoothest taste* if you were to smoke it?'; (iii) 'If you were to choose between them, which one would you buy if you were trying to *reduce the risk* to your health?' and (iv) 'Of these two brands, which is the *most attractive*?' For the fifth question, adult smokers were asked: 'Which brand do you think would make it *easier* to quit smoking?', whereas youth were asked 'If you were to *try smoking* one of these brands which would you use?' Participants could select either of the two packs or a 'neither/no difference' option prominently displayed on the screen.

For each brand pair, the position of the two packs on the computer screen (i.e. left or right) was randomized. The presentation order of the packs was also randomized across participants, with the exception of the presentation order of the plain packs (see below).

Cigarette packs

Cigarette packs used in this study featured leading UK brands—see figure 1. Brands were purposefully selected to examine common brand descriptors and colour variations. Prior to the study, it was hypothesized that one pack from each brand pair would be significantly more likely to be rated as lower tar, smoother taste, lower health risk, more attractive and either easier to quit or the preferred brand for trying cigarettes. For simplicity, these packs will be referred to as the 'Light/Low Tar' brands and included the following: Marlboro Gold, Mayfair Smooth, L&B Gold, Richmond Light, Mayfair Smooth, Silk Cut Silver and B&H silver.

Plain packs

Two of the brand pairs ('L&B Gold' vs. 'L&B King Size' and 'Mayfair Smooth' vs. 'Mayfair King Size') were modified to examine the impact of plain packaging. Plain versions of

these packs were created by substituting all brand imagery and colour for a plain 'white' background or a plain 'brown' background. The name of each brand was printed in Arial 14 point font—see figure 2.

All of the packs shown to participants displayed the same pictorial health warning covering 30% of the 'front' of the pack in anticipation of the pictorial warnings that were introduced in the UK in October 2008, four months after the study was conducted.

Analysis

All analyses were conducted using SPSS software (Version 16.0). Primary analyses focussed on two research questions: (i) the extent to which participants endorsed *either of the packs* as lower health risk, etc., versus selecting 'no difference'; and (ii) the extent to which participants selected the pack that was hypothesized to be perceived as a 'light/low tar' brand. Chi square tests were used to test which pack was more likely to be selected within each brand pair. Two summary scales were also created. For each of the five questions (tar level, health risk, etc.), a 'Difference Scale' was calculated to examine how often respondents selected either of the packs, as opposed to selecting 'no difference'. A score of '1' was assigned each time respondents selected either of the two packs. Scores were summed across the eight brand pairs for a total score between 0 and 8. A 'Light/Low Tar Brand' Scale was calculated in the same way to examine how often respondents selected brands designated as 'light/low tar'. Each of these scales served as the outcome variable in linear regression models described below.

Results

Sample characteristics

A total of 516 adult smokers and 806 youth completed the survey. Table 1 shows the characteristics of each sample.

Beliefs about cigarette packaging: adult smokers

Figure 1 shows the responses to the five questions for each brand pair. Overall, 25.4% of adult smokers correctly reported that there was no difference in health risk for all eight brand pairs, while 17.4% correctly reported there were no differences in tar delivery for all eight conditions. For all five questions asked of brand comparisons 1–8, adult smokers were significantly more likely to select the pack that was hypothesized to be a 'light/low tar' brand prior to the study ($P < 0.001$ for all). The single exception was that no significant difference was observed in attractiveness ratings between 'Silk Cut Silver' vs. 'Silk Cut Purple' (comparison 6).

Linear regression models were conducted to examine the effect of gender, social grade, age and the number of cigarettes per day on: (i) perceiving a difference between brands and (ii) selecting a 'light/low tar' brand. As table 2 indicates, few differences were observed, with the exception that younger adult smokers were more likely to perceive a difference in tar delivery between brands, and adult smokers who reported smoking fewer cigarettes per day were significantly more likely to perceive 'light/low tar' brands as more attractive.

Perceptions of cigarette packaging: youth

The pattern of results observed among the youth sample was similar to adult smokers. Only 27.2% of youth correctly reported that there was 'no difference' in health risk for all eight brand pairs, while only 19.4% correctly reported there was 'no difference' in tar delivery for all eight pairs. As with













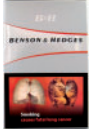


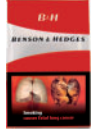
		Marlboro "Gold" vs. Marlboro "Red"			Mayfair King Size "Smooth" vs. Mayfair King Size				
				No Difference			No Difference		
ADULTS									
Delivers less tar		65%	2%	33%	64%	2%	34%		
Smoother taste		53%	8%	39%	73%	2%	25%		
Lower health risk		53%	3%	44%	52%	2%	46%		
More attractive		32%	16%	52%	23%	11%	66%		
Easier to quit		31%	8%	61%	31%	6%	63%		
YOUTH									
Delivers less tar		33%	7%	60%	63%	4%	33%		
Smoother taste		29%	7%	64%	73%	3%	24%		
Lower health risk		29%	6%	65%	54%	3%	43%		
More attractive		25%	19%	56%	25%	17%	58%		
Try smoking		25%	13%	62%	39%	10%	51%		
	Lambert & Butler Gold vs. Lambert & Butler King Size	Richmond "Light" vs. Richmond minus "Smooth"			Mayfair "Smooth" vs. Mayfair minus "Smooth"				
	  No Difference	  No Difference	  No Difference						
ADULTS									
Delivers less tar	42%	15%	43%	69%	3%	28%	50%	4%	46%
Smoother taste	42%	12%	46%	52%	9%	39%	70%	3%	27%
Lower health risk	32%	10%	58%	57%	3%	40%	42%	3%	55%
More attractive	25%	16%	59%	18%	7%	75%	21%	7%	72%
Easier to quit	23%	9%	68%	33%	6%	61%	24%	7%	69%
YOUTH									
Delivers less tar	41%	12%	47%	65%	5%	30%	52%	4%	44%
Smoother taste	39%	10%	51%	54%	8%	38%	74%	3%	23%
Lower health risk	33%	10%	57%	59%	3%	38%	43%	6%	51%
More attractive	34%	15%	51%	26%	9%	65%	28%	8%	64%
Try smoking	30%	14%	56%	41%	7%	52%	39%	7%	54%
	Silk Cut "Silver" vs. Silk Cut "Purple"	Benson & Hedges minus "Silver" vs. Benson & Hedges Dark Gray Colour			Benson & Hedges minus "Silver" vs. Benson & Hedges Dark Red Colour				
	  No Difference	  No Difference	  No Difference						
ADULTS									
Delivers less tar	51%	7%	42%	38%	3%	59%	47%	5%	48%
Smoother taste	37%	16%	47%	33%	5%	62%	42%	7%	51%
Lower health risk	43%	5%	52%	32%	3%	65%	39%	3%	58%
More attractive	18%	22%	60%	27%	10%	63%	32%	13%	55%
Easier to quit	27%	6%	67%	19%	7%	74%	21%	8%	71%
YOUTH									
Delivers less tar	31%	11%	58%	29%	4%	67%	33%	5%	62%
Smoother taste	30%	15%	55%	27%	5%	68%	30%	7%	63%
Lower health risk	28%	9%	63%	24%	5%	71%	28%	7%	65%
More attractive	17%	29%	54%	26%	14%	60%	26%	23%	51%
Try smoking	21%	20%	59%	24%	10%	66%	25%	14%	61%

Figure 1 Perceptions of cigarette packs among UK children (n = 806) and adult smokers (n = 516)

	Mayfair King Size White Background vs. Mayfair King Size			Mayfair King Size Brown Background vs. Mayfair King Size			Mayfair "Smooth" White Background vs. Mayfair King Size White Background		
			No Difference			No Difference			No Difference
ADULTS									
Delivers less tar	26%	6%	68%	15%	14%	71%	55%	3%	42%
Smoother taste	16%	12%	62%	9%	18%	73%	66%	3%	31%
Lower health risk	20%	5%	75%	11%	11%	78%	42%	3%	55%
More attractive	13%	40%	47%	12%	39%	49%	15%	6%	79%
Easier to quit	16%	4%	80%	11%	7%	82%	24%	4%	72%
YOUTH									
Delivers less tar	22%	12%	66%	17%	16%	67%	55%	4%	41%
Smoother taste	15%	19%	66%	13%	20%	67%	67%	4%	29%
Lower health risk	17%	12%	71%	13%	16%	71%	44%	4%	52%
More attractive	6%	51%	43%	8%	49%	43%	18%	5%	77%
Try smoking	10%	30%	60%	8%	30%	62%	29%	7%	64%
	Lambert & Butler King Size vs. Lambert & Butler Brown Background			Lambert & Butler King Size vs. Lambert & Butler King Size White Background			Lambert & Butler "Gold" Brown Background vs. Lambert & Butler King Size Brown Background		
			No Difference			No Difference			No Difference
ADULTS									
Delivers less tar	19%	13%	68%	9%	21%	70%	30%	7%	63%
Smoother taste	20%	11%	69%	13%	17%	70%	28%	6%	66%
Lower health risk	15%	9%	75%	6%	17%	77%	21%	5%	75%
More attractive	42%	9%	49%	39%	13%	48%	11%	6%	83%
Easier to quit	9%	10%	81%	5%	15%	80%	13%	4%	83%
YOUTH									
Delivers less tar	21%	18%	61%	15%	20%	65%	36%	8%	56%
Smoother taste	26%	12%	62%	23%	15%	62%	33%	6%	61%
Lower health risk	20%	13%	67%	15%	16%	69%	29%	6%	65%
More attractive	52%	7%	41%	52%	8%	40%	15%	6%	79%
Try smoking	33%	8%	59%	33%	9%	58%	21%	6%	73%

Figure 2 Perceptions of plain packs among UK children ($n = 806$) and adult smokers ($n = 516$)

adult smokers, youth perceived the 'light/low tar' brands in each of the eight brand pairs as significantly more likely to have smoother taste, greater tar delivery, lower health risk, more attractive, as well as their preferred brand if they were to try smoking (see figure 1 for proportions, $P < 0.001$ in all cases). The exceptions were no significant differences in perceptions of attractiveness for comparison 8, or for their preferred brand in comparison 6. As table 3 indicates, youth smokers were significantly more likely than youth non-smokers to perceive a difference between brands and to select 'light/low tar' brands for all measures.

Perceptions of plain packaging

Adult smokers

The Mayfair plain white pack in comparison 9 was perceived by significantly more adult smokers as less attractive than

its branded counterpart ($P < 0.001$), as well as lower tar ($P < 0.001$), lower health risk ($P < 0.001$) and easier to quit ($P < 0.001$), with no difference in smooth taste. The Mayfair plain brown pack in comparison 10 was significantly more likely to be perceived as less attractive ($P < 0.001$) and less smooth ($P < 0.001$), with no significant differences in tar level, health risk or ease of quitting compared with the branded version.

Similar findings were observed for the second brand, L&B King Size. Compared with the 'normal' branded L&B pack in comparison 12, the plain white version was rated as significantly less attractive ($P < 0.001$), lower tar ($P < 0.001$), lower health risk ($P < 0.001$) and easier to quit ($P < 0.001$), with no difference for smooth taste. The plain brown version in comparison 13 was rated as less attractive ($P < 0.001$), less smooth ($P < 0.001$), higher tar ($P = 0.02$), and greater health risk ($P = 0.005$) than the 'normal' brand, with no difference in ease of quitting.

Table 1 Sample characteristics

	Adults (n = 516)	Children (n = 806)
Mean age		
(SD)	38.5 (13.6)	14.6 (2.0)
Gender		
Male	48.6%	51.6%
Female	51.4%	48.4%
Social grade		
ABC1	53.5%	49.6%
C2DE	46.5%	50.2%
Smoking status		
Non-smoker	–	72.6%
Monthly smoker	14.7%	1.5%
Weekly smoker	19.6%	3.7%
Daily smoker	65.7%	22.2%
Mean cigarettes per day (SD)	11.0 (9.6)	8.4 (6.2)
Intention to quit		
Within the next month	20.0%	12.6%
Within the next 6 months	21.1%	19.3%
Sometime in the future, beyond 6 months	29.3%	27.4%
Not planning to quit/don't know	29.6%	23.3%

Table 2 Linear regression predicting perceptions of cigarette brands among adult smokers (n = 497)

	Sex	Age	Social grade	CPD	Model R ²
Likelihood of selecting 'No Difference' between brands					
Smooth taste	-0.03	0.08	0.02	0.06	0.02
Tar delivery	-0.02	0.11*	0.04	0.03	0.02
Health risk	-0.03	0.04	0.04	0.04	0.01
Attractiveness	0.01	0.05	0.06	0.09	0.02
Ease of quitting	0.01	0.02	0.01	0.01	0.01
Likelihood of selecting 'light/low tar' brand					
Smooth taste	0.06	-0.05	-0.01	-0.07	0.02
Tar delivery	0.02	-0.09	-0.04	-0.05	0.02
Health risk	0.01	-0.05	-0.04	-0.03	0.01
Attractiveness	0.08	-0.05	-0.07	0.12*	0.03
Ease of quitting	-0.08	-0.03	-0.02	0.01	0.01

Standardized β * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Youth smokers

For the Mayfair brand pair in comparison 9, the plain Mayfair white pack was rated by youth as significantly less attractive ($P < 0.001$) and it was also significantly less likely to be the preferred brand if they were to try smoking ($P < 0.001$) than its normal branded counterpart. Youth also rated the Mayfair plain white pack as lower tar ($P < 0.001$) and lower health risk ($P = 0.005$), with no differences in smooth taste. In comparison 10, the brown plain pack was rated as less attractive than the normal branded pack ($P < 0.001$), as well as less smooth ($P = 0.001$) and less likely to be preferred for trying smoking ($P < 0.001$), with no significant differences in tar level or health risk.

Similar findings were observed among youth for the second brand pair, L&B King Size. Compared with the 'normal' branded L&B pack in comparison 13, the plain white version was rated by youth as significantly less attractive ($P < 0.001$), lower tar ($P = 0.05$), less smooth ($P < 0.001$) and less likely to be selected for trying smoking ($P < 0.001$), with no difference for lower health risk. The brown plain version in comparison 12 was rated as less attractive ($P < 0.001$), less smooth ($P < 0.001$), higher risk ($P = 0.001$), and less likely to be selected for trying smoking ($P < 0.001$), with no difference in tar level.

Table 3 Linear regression predicting perceptions of cigarette brands among children (n = 795)

	Sex	Age	Social grade	Smoking status	Model R ²
Likelihood of selecting 'No Difference' between brands					
Smooth taste	-0.01	0.02	0.06	-0.19***	0.03
Tar delivery	-0.02	0.04	0.03	-0.18***	0.03
Health risk	-0.02	0.04	0.01	-0.21***	0.04
Attractiveness	-0.07*	0.01	0.04	-0.11**	0.02
Brand appeal	-0.02	-0.02	0.02	-0.22***	0.04
Likelihood of selecting 'light/low tar' pack					
Smooth taste	0.01	-0.02	-0.06	0.16***	0.02
Tar delivery	0.02	-0.05	-0.05	0.17***	0.03
Health risk	0.01	-0.05	-0.03	0.22***	0.04
Attractiveness	0.06	-0.02	-0.07	0.10*	0.02
Brand appeal	0.01	-0.02	-0.03	0.14**	0.02

Standardized β * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Comparisons between plain packs

The plain packs were also used to examine the perception of text descriptors in isolation from other aspects of branding. When shown two plain white packs in comparison 11, adult smokers rated the pack with the word 'Smooth' as significantly smoother, lower tar, lower health risk, more attractive and easier to quit smoking ($P < 0.001$ for all). When shown two plain brown packs in comparison 14, adult smokers were significantly more likely to rate the pack with the word 'Gold' as smoother taste ($P < 0.001$), lower tar ($P < 0.001$), lower health risk ($P < 0.001$), easier to quit ($P < 0.001$) and more attractive ($P = 0.003$). The same pattern of results was observed among youth for comparison 11 and comparison 14 ($P < 0.001$ for all).

When comparing results between the plain white Mayfair packs in comparison 11 with the corresponding branded packs in comparison 2, significantly fewer adult smokers perceived the plain packs as having differences in taste, tar delivery, health risk, attractiveness and ease of quitting ($P < 0.001$ for all). The same pattern was true when comparing the plain brown packs in comparison 14 with their branded counterparts in comparison 3 ($P < 0.001$ for all). The same results were found for youth ($P < 0.001$ in all cases, with the exception of the 'attractiveness' question where $P = 0.008$).

Discussion

Despite scientific evidence to the contrary, substantial proportions of youth and adult smokers reported that some cigarette brands were less harmful than others based on the words and design elements of packs. Overall, 75% of adult smokers incorrectly believed there was a difference in health risk between at least one of eight brand comparisons shown. The brand labelled with the prohibited term 'light' was most likely to be perceived as less harmful; however, brands labelled as 'smooth', 'gold' and 'silver' were also perceived as significantly less harmful. Adult smokers were also more likely to believe that each of these brands delivered less tar, was more attractive and to incorrectly believe that these brands would make it easier to quit smoking. These findings are consistent with recent findings on perceptions of tobacco packaging among Canadian adults.²⁸

The colour of packs was also associated with false beliefs about tar delivery and health risk: packs with lighter colours were rated as less harmful and easier to quit. These findings are consistent with research among Canadian adults,²⁸ research conducted inside the tobacco industry on the influence

of colour,^{5,12} as well as research in other domains, such as the influence of pill colour on the strength of placebo effect.²⁹

This study also indicates that children as young as 11 years old hold false beliefs about the risks of cigarette brands based on the words and colouring of packs. The brands that youth judged to be less hazardous were also perceived as more attractive and the preferred option for trying smoking. These findings are consistent with a US survey, in which youth reported that 'light' cigarettes were less addictive, associated with fewer health effects and the preferred option for trying smoking compared with 'regular' varieties.^{19,30} More generally, the findings underscore the importance of brand imagery on the pack to youth.^{12,20,31}

Youth smokers were significantly more likely than youth non-smokers to perceive differences between packs. There are several potential explanations for this finding. First, youth who underestimate the health risks and addictive potential of certain brands may be more likely to become smokers. Second, false beliefs about brands may develop after smoking initiation, as a form of 'optimistic bias'.^{12,32} Third, false beliefs about the health risks of brands may be driven by the sensory experience of smoking cigarettes. Brands labelled as 'smooth' and those in lighter coloured packs typically have filters that reduce the harshness of smoke inhalation.^{8,18} However, significant proportions of youth who were non-smokers also reported false beliefs for the same brands as smokers in this study. Therefore, false beliefs can not be due solely to the sensory experience of smoking a cigarette. Indeed, research conducted by the tobacco industry has demonstrated that pack design and the names of cigarette brands are capable of altering sensory perceptions from smoking a cigarette even among adult smokers trained to detect subtle differences between brands.³³

The findings also demonstrate that removing promotional information from packs reduces false beliefs about the risks of cigarette brands. When viewing plain packs with a standardized appearance, adult smokers and youth were less likely to believe that either brand delivered less tar was less harmful, more attractive or was easier to quit smoking. Perhaps most important, youth were less likely to identify brands in plain packages as more appealing if they were to try smoking. This is consistent with previous research indicating that youth find plain packages less attractive and believe they would help to reduce smoking uptake.^{25,34,35} The extent to which other aspects of packaging might influence perceptions of risk, such as the shape and size of packs, was not addressed in this study.

Although false beliefs were significantly lower when participants compared brands in plain packs to the 'normal' packs with colour, false beliefs were still present in considerable numbers in the plain packaging comparisons, in which the only difference between packs were the words 'smooth' and 'gold'.

Strengths and limitations

This study has several limitations. Participants in this study were not selected randomly. Therefore, the findings are not necessarily generalizable to the UK population. The survey responses from youth may also have been subject to parental influence, which may have influenced truthful reporting, particularly with respect to smoking status. Under-reporting of smoking status among youth may have led to an underestimation of differences between youth smokers and non-smokers. Perceptions of packs among both youth and adults may also have been influenced by social desirability bias, although the potential influence of this bias is unclear. Given

that public health messages have stressed that all cigarettes are equally harmful, the socially desirable response would presumably have been to report no differences between the health risks brands. Therefore, the proportion of individuals who reported differences between packs may be an underestimate.

Implications

The current findings provide additional evidence that cigarette descriptors, such as 'smooth', are perceived in a similar way as prohibited terms such as 'light' and 'mild'. These terms appear to violate existing EU directives, as well as guidelines of the WHO FCTC treaty, which prohibit information 'that directly or indirectly creates the false impression that a particular tobacco product is less harmful than other tobacco products'.²²

This study has the potential to inform plain packaging proposals included in a recent consultation paper from the UK government.³⁶ The potential public health benefit of these measures is underscored by the response of tobacco companies to the consultation paper: '...we think plain packaging would go a long way to undermine the power of tobacco brands and it is the brands that make the industry so profitable. In our view, in cigarettes, the pack is the brand.'³⁷

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Key points

- Substantial proportions of youth and adult smokers erroneously reported that some cigarette brands were less harmful than others based on the words (e.g. 'smooth' and 'silver') and design elements of cigarette packs.
- Removing design elements from packs, i.e. plain packaging, reduced false beliefs about the risks of cigarette brands.
- Tobacco manufacturers may be violating the law regarding packaging as they are using terms and imagery which imply to consumers that some brands are safer than others.
- Regulators should require standardized or 'plain' package colours and the removal of terms such as 'smooth', 'gold' and 'silver' from packaging.

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