



Original article

The Effect of Cigarette Branding and Plain Packaging on Female Youth in the United Kingdom

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A B S T R A C T

Purpose: Cigarette packaging is the most prominent form of tobacco marketing remaining in countries such as the United Kingdom. The current study examined perceptions of cigarette packaging among female youth and the potential impact of “plain” cigarette packaging regulations.

Methods: A national sample of 947 16- to 19-year-old female subjects in the United Kingdom completed an online survey. Participants were randomized to view 10 cigarette packs designed according to one of four experimental conditions: fully branded female packs, the same packs without descriptor words, the same packs without brand imagery or descriptors (“plain” packs), and branded non-female brands. Participants rated packs on measures of appeal and health risk, positive smoker image, and completed a behavioral pack selection task.

Results: Plain packs were rated as the least appealing and worse tasting compared with all other conditions. Plain packs were also associated with fewer false beliefs about health risks compared with branded packs. Removing brand descriptors from packs significantly reduced measures of appeal and taste, particularly for brands with flavor descriptors, such as cherry and vanilla. Plain packs were significantly less likely to be associated with positive images, such as glamour, sophistication, and slimness. Most importantly, respondents were significantly less likely to accept a pack of cigarettes when offered only plain versus branded packs ($p = .026$).

Conclusions: Marketing in the form of pack branding remains a potent tool for increasing the appeal of tobacco products to young women. The findings provide empirical support for plain cigarette packaging regulations in Australia to be implemented in 2012.

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**IMPLICATIONS AND
 CONTRIBUTION**

The current study indicates that package branding promotes the appeal of tobacco products to young women at the critical age during which smoking initiation occurs. The findings provide additional support for Australia’s plain packaging legislation, as well as the U.K. Department of Health’s ongoing consultation on plain packaging of cigarettes [24].

Tobacco industry analysts have recently referred to women as the “sleeping giant of the tobacco market” (p. 29) [1]. Globally, an estimated 250 million women currently smoke. However, prevalence is projected to increase in the coming decades, primarily driven by increases in low- and middle-income countries [2].

In the United Kingdom, tobacco use among women increased dramatically after World War II and peaked at 44% in 1970 [3].

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Currently, 20% of women in the United Kingdom smoke, including 31% of 20–24 year olds [4]. The smoking-related disease burden among U.K. women continues to increase, given the lag between smoking onset and the onset of many smoking-related diseases.

Young women and youth are an important target group for tobacco industry marketing [5]. In countries with comprehensive restrictions on advertising such as the United Kingdom, packaging is the most prominent form of marketing. In the United Kingdom, 11–16 year olds report high levels of awareness of tobacco marketing within retail outlets [6], a characteristic that has been associated with greater brand awareness and susceptibility to smoking [7], similar to findings in other jurisdictions [8].

Although female-oriented packaging has been on the market for decades, there has been a recent proliferation of overtly female brands on the European market [5]. Brands and packaging can create positive lifestyle associations with fashion, sophistication, empowerment, femininity, wealth, freedom, and even weight reduction [5]. For example, “slim” brands marketed in tall narrow packs with names such as Vogue capitalize on associations with the fashion industry and slimness. The package also highlights product characteristics, including appealing flavors and design features characteristic of ostensibly “lower tar” or “light” brands marketed to young women.

Previous research has shown that packaging is associated with false health beliefs [9]. Brands labeled as “smooth” and those with lighter colors are perceived as less harmful than “regular” brands or those with darker colors [10]. Pack color and branding are particularly important with respect to establishing brand appeal among youth [11–16]. At least one study has shown that pack branding increases beliefs that smoking helps people control their appetite, an important predictor of smoking among young women [15].

In December 2012, Australia will become the first country in the world to prohibit brand logos and imagery from appearing on cigarette packages. Under the so-called “plain packaging” regulations, packs would display the brand name in a regulated font style and size, printed against a dark olive brown background [17]. The pack size and shape would also be standardized, as would the appearance and color of cigarette sticks themselves. Health warnings and tax stamps would remain on packages as required by the government.

Evidence to date indicates that young women perceive “plain” packs as less attractive and engaging [15,16]. Plain packaging may also reduce false beliefs about the relative risk of cigarette brands and enhance the effectiveness of health warnings by increasing their noticeability, recall, and believability [11,18,19].

The current study examined perceptions of cigarette packaging among young women in the United Kingdom. The study sought to examine the impact of plain packaging on (1) perceptions of appeal, taste, tar delivery, and health; (2) positive smoker traits or characteristics; and (3) a behavioral measure of whether respondents would accept a pack offer.

Methods

Participants and recruitment

Participants consisted of 947 young women between the ages of 16 and 19 years, including both smokers and nonsmokers. Participants were recruited from a consumer panel with a reach of more than 300,000 individuals through Global Market Insight, Inc. (Bellevue, WA; <http://www.gmi-mr.com/global-panel/>). E-mail invitations were sent to parents or guardians, who then gave consent for their child to complete the survey. Invitations did not indicate the nature or purpose of the study. Participants were provided with remuneration of approximately \$2. This study received full clearance from the Office of Research Ethics at the University of Waterloo.

Protocol

A between-group experiment was conducted in which participants were randomized to one of four experimental conditions.

Within each condition, participants viewed 10 cigarette packages presented one at a time in random order. Packs within each condition were designed to display characteristics of the experimental condition: (1) “standard” fully branded female-oriented packages; (2) female-oriented packages with brand imagery and colors, but without descriptors (i.e., “slims”); (3) female-oriented packages without brand imagery and descriptors (i.e., “plain” packages); and (4) popular U.K. brands of “regular” or non-female-oriented packages (Figure 1). Participants were asked to rate each pack on four brand ratings and seven “smoker trait” questions (described later in the text). Packs were displayed on the screen while participants answered each question, and participants could view the packs for as long as they wished before answering.

Selection of packages. The 10 “female-oriented” brands were selected based on previous research [15]. Brands were purposefully selected to examine the descriptors superslims, menthol, frost, silver, pink, purple, blue, cherry, vanilla, and arome, as well as “traditional” female color schemes, such as pink and white (Figure 1). Female-oriented packaging was modified according to the experimental condition, as shown in Figure 1. Condition 4 included leading varieties of non-female-oriented “male” packages as a control condition.

Measures

Sociodemographic variables and moderators. Education level, income, and ethnicity were assessed using previously validated measures [20]. Education was categorized as “low” (primary school or some secondary school), “medium” (completed secondary school), or “high” (some university and higher). Smokers were defined as respondents who reported smoking daily, weekly, or monthly. Nonsmokers were defined as respondents who reported smoking less than monthly or not at all. Age was recoded into two categories: older than the legal age for purchasing cigarettes (18–19 years old) and younger than the legal age for purchasing cigarettes (16–17 years old). Ethnicity was measured as “white,” “Asian/Asian British,” “black/black British,” “Chinese,” “mixed,” and “other,” and recoded as “white” versus “other” for the analyses. An index of smoking and weight control beliefs (Cronbach $\alpha = .74$) was calculated from three measures: (1) “Smoking helps people stay slim,” (2) “Quitting smoking causes weight gain,” and (3) “Smoking helps people control their appetites,” using a 5-point Likert scale from “strongly agree” to “strongly disagree.”

Brand ratings. Participants were asked to rate each package on four measures: (1) brand appeal (“How appealing is this brand of cigarettes compared to other brands on the market?”); (2) brand taste (“How do you think these cigarettes would taste, compared to other brands?”); (3) tar delivery (“How much tar do you think these cigarettes would have compared to other brands?”); and (4) health risks (“Compared to other cigarette brands on the market, would these cigarettes be . . . less/more harmful”). Responses were provided on a 5-point Likert scale (e.g., 1 = “A lot more appealing” to 5 = “A lot less appealing”) and subsequently coded as either a 1 (“a little”/“a lot more appealing”) or 0 (“a little”/“a lot less appealing” and “no difference”). An overall index rating was created for each of the four measures, by summing scores across the 10 packages to yield a score between 0 and 10.

Condition 1 : Standard female packs**Condition 2: No descriptors****Condition 3: "Plain" packs****Condition 4: Non-female packs**

Figure 1. Cigarette packs by experimental condition.

Smoker image ratings. For each package, respondents were asked to identify the typical smoker of each pack by answering the question, "In your opinion, someone who chooses to smoke this brand is *more likely* to be ..." for seven characteristics: female/male, glamorous/not glamorous, cool/not cool, popular/not popular, attractive/unattractive, slim/overweight, and sophisticated/not sophisticated. For each set of traits, respondents could choose either trait, "don't know," or "no difference." The female/male question was recoded, so "female" was scored a "1," and "male," "no difference," and "don't know" were scored a "0." For the remaining traits, the more desirable trait (e.g., glamorous) was scored a "1," and the less desirable trait (e.g., not glamorous), "no difference," and "don't know" were scored a "0." An index variable was created for each of the seven characteristics by summing the number of desirable traits endorsed by smokers across the 10 brands (range: 0–10). An overall "smoker image" variable was created by calculating the average across each of the seven characteristics (Cronbach $\alpha = .94$).

Behavioral task—pack selection. Before completion of the study, participants were asked which, if any, packs they would like to be

sent from a choice of four cigarette packs displayed on the screen. The position of packs on the screen was randomized, and packs were displayed according to one of two experimental conditions: (1) four fully branded female packs or (2) four "plain" female packs. Participants were randomly assigned to the experimental conditions, regardless of their assigned condition in the previous sections. Packs were drawn at random from the packs displayed earlier in the study. Participants could also select an "I do not want a pack of cigarettes" option, prominently displayed on the screen. Note that participants were informed immediately after making their selection that no packs would be mailed.

Analysis

All analyses were conducted in SPSS version 20 (IBM Corporation, Armonk, NY). The analysis tested three primary hypotheses: (1) Fully branded female packages in the "standard" condition will be rated as significantly more appealing, better taste, lower tar, and less harmful compared with female brands in the "plain pack" and "no descriptor" condition; (2) Fully branded packs will be associated with more positive smoker traits than

packs in the “plain,” “no descriptor,” and “male” pack conditions; and (3) Respondents offered a fully branded “standard” pack will be more likely than those offered a “plain” package to accept a package. Linear regression models were used to examine differences across experimental conditions for the appeal, taste, tar, and health risk index variables, as well as all smoker trait index variables (range: 0–10). The normality of residuals and equality of residual variances were examined across the experimental groups for each of the indices. To address heteroscedasticity across experimental groups, the tar and health risk indices were log transformed, and a square root transformation was applied to the smoker trait index. Heteroscedasticity across experimental conditions remained for the taste index; given that the residuals appeared to be normality distributed, no transformation was applied. Because differences in smoking behavior were observed between experimental conditions (as described in the Results section), all linear regression models included the following covariates: age, education, ethnicity, smoking status, and weight concerns. Therefore, all values reported from the linear regression models represent “adjusted” values. Unstandardized betas (β) are reported for all linear regression models. Finally, comparisons across conditions for each of the individual 10 female-oriented packages (shown in Table 2) were tested using logistic regression models, where 1 = more appealing, better taste, lower tar, and less harmful, and 0 = no difference or less appealing, worse taste, higher tar, and more harmful, adjusting for age, education, ethnicity, smoking status, and weight concerns. The Hosmer–Lemeshow test was used to test the logistic regressions for goodness-of-fit.

Results

Sample characteristics

Table 1 shows sample characteristics. Smoking status varied by experimental condition ($\chi^2 = 10.3, p = .016$): participants in the no descriptor condition were less likely to report current smoking compared with participants in the standard pack con-

dition ($\beta = -.50, p = .016$), the plain condition ($\beta = -.54, p = .006$), and the male condition ($\beta = -.59, p = .007$). No other significant differences in smoking behavior or sociodemographic variables were observed across conditions.

Effect of female cigarette packages on perceptions of appeal

Appeal ratings. Table 2 shows brand appeal ratings for individual packs. The highest appeal ratings were given for the white and pink Vogue Arome pack and the Capri Cherry pack. Logistic regression models were conducted for each of the 10 packs to examine differences across conditions, adjusting for age, education, ethnicity, smoking status, and weight concerns. Significant differences are noted in Table 2 for packs appearing in the same column.

A linear regression was conducted using an index score for brand appeal across all 10 packs to examine differences between experimental conditions, adjusting for the covariates. A significant effect of condition was found ($F_{(3,740)} = 61.3, p < .001$): packs in the standard condition (mean = 4.9) were rated more appealing than packs in the plain (mean = 2.3, $\beta = -2.67, p < .001$) and male conditions (mean = 2.9, $\beta = -2.07, p < .001$). The plain packs were also given lower appeal ratings than packs in the no descriptor (mean = 4.7, $\beta = -2.40, p < .001$) and male conditions ($\beta = -.60, p = .013$), and male packs were given lower appeal ratings than the no descriptor packs ($\beta = -1.80, p < .001$). In addition, women with more weight concerns were more likely than women with fewer weight concerns ($\beta = .26, p = .001$) to rate packs as appealing. Smokers ($\beta = .48, p = .007$) and respondents reporting nonwhite ethnicity were also significantly more likely to rate packs as appealing ($\beta = .82, p = .001$).

Pack taste ratings. Table 2 shows tar ratings for each individual pack, including significant differences across experimental conditions for each of the 10 packs. As Table 2 shows, three of the top four taste ratings were given for fully branded female packs with flavor descriptors: Capri Cherry, Capri Vanilla, and Benson & Hedges Menthol Superslims. A linear regression model was con-

Table 1
Sample characteristics (n = 947)

Characteristic	Experimental condition				Total n = 947
	Standard n = 222	No descriptors n = 238	Plain n = 258	Male n = 229	
Age (years)					
Mean (SD)	17.8 (1.08)	17.8 (1.03)	17.8 (1.04)	17.8 (1.03)	17.8 (1.04)
Ethnicity (n)					
White	84.9% (185)	81.4% (193)	89.4% (228)	81.7% (183)	84.5% (789)
Other	15.1% (33)	18.6% (44)	10.6% (27)	18.3% (41)	15.5% (145)
Education (n)					
Low	7.8% (17)	12.1% (28)	11.2% (28)	9.8% (22)	10.3% (95)
Medium	55.3% (120)	56.7% (131)	57.0% (143)	64.0% (144)	58.2% (538)
High	36.9% (80)	31.2% (72)	31.9% (80)	26.2% (59)	31.5% (291)
Smoking status (n)					
Nonsmoker	67.4% (149)	75.7% (178)	66.3% (171)	66.0% (149)	68.9% (647)
Daily smoker	22.6% (50)	16.2% (38)	24.4% (63)	23.9% (54)	21.8% (205)
Weekly smoker	5.9% (13)	5.5% (13)	6.2% (16)	6.6% (15)	6.1% (57)
Monthly smoker	4.1% (9)	2.6% (6)	3.1% (8)	3.5% (8)	3.3% (31)
Cigarettes per day ^a					
Mean (SD)	11.8 (11.1)	13.3 (15.3)	11.1 (8.3)	13.5 (12.4)	12.3 (11.6)
Plans to quit smoking ^a					
In next 6 months (n)	37.1%	40.7%	31.3%	42.3%	37.5%

^a Among current smokers only.

Table 2
Brand ratings for individual cigarette packages by experimental condition

Experimental condition										
	“A little” or “A lot” more appealing than other brands (% agree)									
Standard (n = 216)	68.7% ^a	64.8% ^a	57.7% ^a	56.5% ^a	53.5% ^a	48.4% ^a	40.7% ^a	40.1% ^a	35.8%	25.5% ^a
No descriptors (n = 230)	67.4% ^b	49.3% ^a	55.3% ^b	49.3% ^b	52.9% ^b	37.4% ^a	37.9% ^b	46.5% ^b	37.8%	22.3% ^b
“Plain” (n = 241)	40.8% ^{ab}	17.4% ^a	29.7% ^{ab}	14.7% ^{ab}	19.6% ^{ab}	16.3% ^a	23.2% ^{ab}	30.0% ^{ab}	41.5%	11.6% ^{ab}
	“A little” or “A lot” better taste than other brands (% agree)									
Standard (n = 206)	44.7% ^a	58.3% ^a	32.8% ^a	24.5% ^a	33.5% ^a	49.0% ^a	16.4%	36.0% ^a	29.7%	19.5%
No descriptors (n = 209)	39.6% ^b	22.4% ^a	29.7%	19.6% ^b	28.8%	20.6% ^a	23.4%	24.4% ^a	27.2% ^a	14.6%
“Plain” (n = 233)	27.4% ^{ab}	11.8% ^a	23.3% ^a	9.5% ^{ab}	23.8% ^a	12.1% ^a	19.2%	27.7%	38.6% ^a	12.7%
	“A little” or “A lot” less tar than other brands (% agree)									
Standard (n = 203)	26.4%	27.8%	19.6%	11.8%	29.4% ^a	31.8% ^{ab}	12.9%	37.3% ^{ab}	25.8% ^a	18.3%
No descriptors (n = 208)	27.8% ^a	24.1%	18.5%	13.0%	22.2%	21.6% ^a	10.7%	21.1% ^a	22.1% ^b	20.1%
“Plain” (n = 218)	19.1% ^a	22.0%	19.0%	13.9%	17.4% ^a	14.4% ^b	11.9%	18.3% ^b	38.1% ^{ab}	13.1%
	“A little” or “A lot” less health risk than other brands (% agree)									
Standard (n = 206)	22.9% ^a	22.5% ^a	17.7%	7.4%	26.2% ^{ab}	25.5% ^a	10.9%	32.0% ^{ab}	16.5% ^a	15.7%
No descriptors (n = 213)	20.7%	16.3%	15.5%	11.9%	14.4% ^a	17.5% ^a	9.9%	15.6% ^a	17.0% ^b	12.9%
“Plain” (n = 231)	15.2% ^a	14.1% ^a	13.4%	12.8%	13.9% ^b	9.1% ^a	11.1%	15.6% ^b	29.3% ^{ab}	11.8%

^{ab} Values with the same letter indicate significant differences at the $p < .05$ level between experimental conditions for individual packages (i.e., values in the same column) in logistic regression models adjusting for age, education, ethnicity, smoking status, and weight concerns.

ducted using the taste index variable across all 10 packs to examine differences across experimental conditions, adjusting for sociodemographic predictors. A significant effect of condition was found ($F_{(3,641)} = 13.8, p < .001$): standard packs (mean = 3.4) were given higher taste ratings than the plain packs (mean = 1.8; $\beta = -1.56, p < .001$) and the male packs (mean = 2.5, $\beta = -1.00, p < .001$). Packs in the plain condition were given lower taste ratings than packs in the male ($\beta = -.55, p = .027$) and no descriptor conditions (mean = 2.5, $\beta = -.62, p = .013$). In addition, respondents who were nonwhite ($\beta = 1.11, p < .001$) and expressed more weight concerns ($\beta = .28, p = .001$) were more likely than white respondents and those with fewer weight concerns to believe the packs would taste better.

Pack tar ratings. Table 2 shows tar ratings for each individual pack, including significant differences across experimental conditions for each of the 10 packs. In a linear regression analysis using the tar index variable across all 10 packs, a marginally significant effect of condition was found after adjusting for covariates ($F_{(3,643)} = 2.6, p = .050$): standard packs (mean = 2.4) were more likely to be rated as having less tar than packs in the male condition (mean = 1.7, $\beta = -.09, p = .013$) and plain conditions (mean = 1.8, $\beta = -.08, p = .024$), with a trend toward less tar than no descriptor packs (mean = 1.9, $\beta = -.07, p = .050$). Smokers ($\beta = .11, p < .001$) and respondents reporting nonwhite

ethnicity were also significantly more likely to rate packs as appealing ($\beta = .13, p = .001$).

Health risk ratings. Table 2 shows health risk ratings for each individual pack, including significant differences between conditions. Overall, 50.7% of respondents reported that at least 1 of 10 brands would be “less harmful” than other brands. In a linear regression model using the health risk index score across all 10 packs, a significant effect of condition was observed after adjusting for covariates ($F_{(3,710)} = 3.4, p = .018$): packs in the standard (mean = 2.0) condition were more likely to be rated as lower health risk than no descriptors (mean = 1.5, $\beta = -.09, p = .007$), male (mean = 1.4, $\beta = -.07, p = .029$), and plain packs (mean = 1.4, $\beta = -.09, p = .006$). In addition, smokers were more likely than nonsmokers to believe that packs would be a lower health risk ($\beta = .08, p = .002$), as were respondents who reported “nonwhite” ethnicity ($\beta = .14, p < .001$).

Smoker image ratings

Participants were asked to rate each pack along seven smoker-image “traits.” Table 3 shows the index scale for each smoker trait (female, slim, glamorous, cool, popular, attractive, and sophisticated) by experimental condition. The index scale indicates the number of packs endorsed for each smoker trait across the 10

Table 3
Index scores of perceived smoker traits by experimental condition

Experimental condition	Mean score (SD)						
	Female	Slim	Glamorous	Cool	Popular	Attractive	Sophisticated
Standard female packs (n = 200)	5.4 ^{abc} (2.0)	3.1 ^{ab} (2.5)	3.6 ^{abc} (2.5)	2.9 ^{ab} (2.5)	2.7 ^{ab} (2.4)	2.8 ^{ab} (2.5)	3.3 ^{abc} (2.7)
No descriptors female packs (n = 210)	4.5 ^{ade} (1.9)	2.6 ^{ad} (2.5)	3.1 ^{ade} (2.3)	2.0 ^{cd} (2.5)	2.4 ^{cd} (2.5)	2.4 ^{cd} (2.4)	2.8 ^{ade} (2.6)
Plain female packs (n = 191)	2.3 ^{bdf} (1.88)	2.1 ^b (2.1)	2.0 ^{bd} (1.9)	1.5 ^{ac} (2.1)	1.9 ^{bc} (2.1)	1.6 ^{ac} (1.9)	2.0 ^{bd} (2.3)
Male packs (n = 197)	1.6 ^{cef} (1.7)	1.8 ^{cd} (2.1)	1.7 ^{ce} (2.0)	1.5 ^{bd} (2.0)	1.6 ^{bd} (2.1)	1.4 ^{bd} (2.0)	2.0 ^{ce} (2.2)

^{abcdef} Values with the same letter indicate significant differences at the $p < .05$ level between experimental conditions for each smoker trait (i.e., values in the same column) in linear regression models adjusting for age, education, ethnicity, smoking status, and weight concerns.

packs viewed by each participant (range: 0–10). A linear regression model was conducted for each of the smoker traits, with experimental condition as the main independent variable and each smoker trait as the dependent variable, adjusting for age, education, ethnicity, smoking status, and weight concerns. Differences across conditions for each of the traits are indicated by the letters. As Table 3 shows, plain packages received significantly fewer positive ratings for every smoker trait.

In a linear regression in which all the different smoker traits across all packs were combined in a single smoker image index where higher scores indicated more positive smoker traits, a significant effect of condition was observed ($F_{(3,622)} = 29.3, p < .001$): packs in the standard condition (mean = 3.4) were given higher positive trait scores than packs in the no descriptors (mean = 2.9, $\beta = -.13, p = .026$), plain (mean = 2.0, $\beta = -.39, p < .001$), and male (mean = 1.7; $\beta = -.49, p < .001$) conditions. Packs in the male condition were given lower positive trait scores than the no descriptors condition ($\beta = -.36, p < .001$). In addition, plain packs were given lower positive trait scores than packs in the no descriptors condition ($\beta = -.26, p < .001$). No differences were observed among covariates.

Pack selection task

Participants were offered a pack of cigarettes that would be sent to them on conclusion of the study. (Note: no packs were actually sent.) Participants either chose not to receive a pack or selected one of four options randomly selected from one of two conditions: fully branded female packs or “plain” female packs. No significant differences for smoking behavior or sociodemographics were observed between conditions. Overall, 48.4% ($n = 458$) of participants accepted the offer and selected a pack, including 80.2% ($n = 235$) of smokers and 34.1% ($n = 223$) of nonsmokers. Of the participants offered four fully branded female packs, 51.8% ($n = 257$) accepted a pack; of the participants offered four “plain” female packs, 44.6% ($n = 201$) of participants accepted a pack. Overall, respondents offered plain packs were significantly less likely than respondents in the branded pack condition ($\chi^2 = 5.0, p = .026$) to accept a pack.

Discussion

The current study suggests that marketing in the form of pack branding remains a potent tool for increasing the appeal of tobacco products to young women and may serve as inducement to smoke for many. The findings indicate that branded female-oriented cigarette packs were perceived by female youth as significantly more appealing, better tasting, and associated with lower levels of health risk than plain packaging or male-oriented packaging. Branded female packs were also associated with more positive smoker images, including glamour, sophistication, popular, and slimness—measures commonly used by the tobacco companies when market pretesting brands [21].

Differences among the individual packs tested in the study highlight the influence of specific branding elements. For example, the three branded packs that received the highest ratings of appeal all had a “slim” shape, and two of the three brands were variants of the Vogue brand “family.” Among plain packs, the most appealing brands were Silk Cut and Vogue—brand names that have an established association with female fashion and glamour. These findings suggest that brand family names may become relatively more important in distinguishing between

brands and promoting appeal in the absence of brand imagery and descriptors. Indeed, a greater proportion of respondents rated the “plain” Silk Cut brand as lower risk than either the branded female pack or the female pack without descriptors. This is most likely because the plain version of the Silk Cut brand is much more distinctive as a female “lighter” brand relative to other plain packs.

Removing brand descriptors from packs significantly reduced measures of appeal and taste. Reductions were the greatest for brands with flavor descriptors, such as cherry and vanilla. This is consistent with previous research indicating that flavors are particularly appealing to youth and young adults [15,16,22]. Interestingly, although removing “menthol” descriptor reduced ratings of appeal, it did not reduce ratings of taste in the same way as other flavors. Menthol brands are much less popular in the U.K. market compared with the U.S. market, and consumer acceptance of this flavoring is likely to be less established in the current sample [23].

As hypothesized, male-oriented brands were rated as less appealing, worse taste, and associated with a less positive smoker image than the standard female packs. In a number of cases, the plain brands were rated even less favorably than the male-oriented packs, and no different in terms of smoker image. These results indicate that plain packaging seriously undermines the ability of packages to target population subgroups, such as female smokers.

The current study used a “pack offer” behavioral measure to assess pack appeal. Assessing behavioral responses to plain packaging presents several methodological challenges. Most notably, the impact of packaging is likely to be incremental over time and to work in synergy with other forms of tobacco marketing, as well as sensory perceptions from using the product itself. Therefore, behavioral measures in an experimental study, such as the current one, are likely to seriously underestimate the influence of packaging. Despite this, young women in the current study were significantly less likely to accept a pack when offered only plain versus branded female packs. Future research examining the actual impact of the policy implementation in Australia should be considered a priority.

Limitations

The sample was drawn from a national heterogeneous sampling frame representing different socioeconomic levels; however, the study did not recruit using probability-based sampling. Therefore, the sample is not likely to be representative of the U.K. population. Although all analyses were based on a priori hypotheses, the analyses reported in the current article involve multiple models and comparisons, which increase the likelihood of type II error. In addition, the primary outcomes reported in this article represent indices based on Likert scales that were recoded into dichotomous outcomes. To ensure that coding did not alter the pattern of the findings, all models were also run with indices based on the full 5-point Likert scales (not reported), and no differences in the pattern of findings were observed.

Self-reported evaluations of cigarette packs may be subject to social desirability bias. In the current study, the socially desirable response may have been to provide lower ratings of appeal and other positive attributes of cigarette brands, thereby underestimating positive pack and trait ratings. However, the between-subjects experimental design and randomization of participants to experimental conditions are considerable strengths of the

study, which ensure that any biases are equal across groups. Finally, participants based their evaluations on images of cigarette packages, rather than observing packs directly. This may have attenuated responses to cigarette packs in some cases, particularly with respect to the shape and size of “slim” packs, which are difficult to convey in a two-dimensional image.

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References

- [1] Euromonitor International. Switcher, quitter, or resister? In search of the tobacco consumer, 2011. Available at: <http://www.euromonitor.com/switcher-quitter-or-resister-in-search-of-the-tobacco-consumer/reportconsumer/report>. Accessed September 9 2011.
- [2] World Health Organization. Gender, women and the tobacco epidemic, 2010. Available at: http://www.who.int/tobacco/publications/gender/women_tob_epidemic/en/index.html. Accessed September 9, 2011.
- [3] Cancer Research UK. Smoking statistics. Available at: <http://info.cancerresearchuk.org/cancerstats/types/lung/smoking/>. Accessed September 9, 2011.
- [4] Office for National Statistics. Smoking and drinking among adults, 2009: A Report on the 2009 general lifestyle survey, 2011. Available at: <http://www.esds.ac.uk/doc/6737%5Cmrdoc%5Cpdf%5C6737report.pdf>. Accessed June 25, 2012.
- [5] World Health Organization Regional Office for Europe. Empower Women—combating tobacco industry marketing in the WHO European Region, 2010. Available at: http://www.euro.who.int/--data/assets/pdf_file/0014/128120/e93852.pdf. Accessed September 9, 2011.
- [6] Brown A, Moodie C. The influence of tobacco marketing on adolescent smoking intentions via normative beliefs. *Health Educ Res* 2009;24:721–33.
- [7] Center for Tobacco Control Research. Point of sale display of tobacco products, 2008. Available at: http://info.cancerresearchuk.org/prod_consump/groups/cr_common/@nre/pol/documents/generalcontent/crukmg_1000ast-3338.pdf. Accessed September 9, 2011.
- [8] Paynter J, Edwards R, Schluter P. Point of sale tobacco displays and smoking among 14–15 year olds in New Zealand: A cross sectional study. *Tob Control* 2009;18:268–74.
- [9] Hammond D, Parkinson C. The impact of cigarette package design on perceptions of risk. *J Public Health (Oxf)* 2009;31:345–53.
- [10] Hammond D, Dockrell M, Arnott D, Lee A, McNeill A. Cigarette pack design and perceptions of risk among UK adults and youth. *Eur J Public Health* 2009;19:631–7.
- [11] Hammond D. “Plain packaging” regulations for tobacco products: The impact of standardizing the color and design of cigarette packs. *Salud Publica Mex* 2010;52(Suppl 2):S226–32.
- [12] Gallopel-Morvan K, Béguinot E, Eker F, et al. Efficacité des paquets de cigarettes standardisés. Une étude dans un contexte français [Effectiveness of plain packaging of tobacco products: Findings from France]. *Bull Épidémiol Hebd* (in press).
- [13] Germain D, Wakefield MA, Durkin SJ. Adolescents’ perceptions of cigarette brand image: Does plain packaging make a difference? *J Adolesc Health* 2010;46:385–92.
- [14] Moodie C, Hastings G, Joossens L. Young adult smokers’ perceptions of illicit tobacco and the possible impact of plain packaging on purchase behavior. *Eur J Public Health* 2012;22:251–3.
- [15] Doxey J, Hammond D. Deadly in pink: The impact of female-oriented cigarette packaging among young women. *Tob Control* 2011;20:353–60.
- [16] Hammond D, Doxey J, Daniel S, Bansal-Travers M. Impact of female-oriented cigarette packaging in the United States. *Nicotine Tob Res* 2011;13:579–88.
- [17] Parliament of the Commonwealth of Australia. A Bill for an act to discourage the use of tobacco products, and for related purposes, 2011. Tobacco Plain Packaging Bill 2011 No. Available at: <http://www.yourhealth.gov.au/internet/yourhealth/publishing.nsf/Content/tpb-bill2011>. Accessed June 25, 2012.
- [18] Hoek J, Wong C, Gendall P, et al. Effects of dissuasive packaging on young adult smokers. *Tob Control* 2011;20:183–8.
- [19] Munafò MR, Roberts N, Bauld L, Leonards U. Plain packaging increases visual attention to health warnings on cigarette packs in non-smokers and weekly smokers but not daily smokers. *Addiction* 2011;106:1505–10.
- [20] Thompson ME, Fong GT, Hammond D, et al. The methodology of the international tobacco control policy evaluation (four-country) survey (ITCPES). *Tob Control* 2006;15:s12–18.
- [21] Wakefield M, Morley C, Horan JK, Cummings KM. The cigarette pack as image: New evidence from tobacco industry documents. *Tob Control* 2002;11(Suppl 1):173–80.
- [22] Lewis MJ, Wackowski O. Dealing with an innovative industry: A look at flavored cigarettes promoted by mainstream brands. *Am J Public Health* 2006;96:244–51.
- [23] Mutti S, Hammond D, Borland R, et al. Beyond light and mild: Cigarette brand descriptors and perceptions of risk in the international Tobacco control (ITC) four country survey. *Addiction* 2011;106:1166–75.
- [24] UK Department of Health. Healthy lives, healthy people: A tobacco control plan for England, 2011. Available at: http://www.dh.gov.uk/en/Publicationandstatistics/Publications/PublicationsPolicyAndGuidance/DH_124917.