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US adult smokers' perceptions of Australia's cigarette warning labels: variance by warning content and consistency across socio-demographic sub-segments

The implementation of Australia's aggressive plain-packing policy in 2012, mandating the removal of all tobacco industry branding and replacement with photographic warnings on 80% of packaging, was associated with a significant decline in smoking prevalence.[1] Could Australia's plain-packaging model have a similar effect on US-adult cigarette users who have not yet been exposed to graphic warning labels on their cigarette packs?

To generate evidence for this, we obtained a license from the Commonwealth of Australia to use up to eight of their current warning images (figure 1). Our randomised trial, entitled California smokers in Australia (CASA), will enrol 450 cigarette users who are not ready to quit and randomise them to purchase cigarettes that have been repackaged into either plain packs, current Australian packs or to a no-change control, for a period of 3 months.[2] Warning labels on cigarette packs can cue cognitions on health consequences each time the consumer reaches for a cigarette, until he or she becomes desensitised. Accordingly, rotating multiple warnings is needed to increase the time before any particular warning 'wears out'.[3 4] Because of cost concerns of manufacturing new cigarette packs in our trial, we decided to rotate only three of the graphic images in our study. In this letter, we report results from a stated preference methodology that allowed US-adult cigarette users to identify which of the eight licensed Australian warnings they believed would be most effective.

Method

We recruited a non-representative sample of US-adult cigarette users (18–50 years), via Amazon Mechanical Turk (http://www.mturk.com), to take a brief survey (N=403).[5] The majority of our sample was younger than 40 years (82%), male (61%), white (77%), did not live with children <5 years (83%), smoked on a daily basis (58%), had completed at least some college (85%) and scored lower than six on a seven-point scale assessing intention to quit smoking (81%). Each respondent ranked the eight current Australian warnings according to "how effectively they communicate the health risk of smoking" with the highest rank indicating the 'most effective'. We estimated the statistical significance of the observed distribution of choices for the 'most effective' warning and the distribution across age, gender, race-ethnicity, education, whether a child lived in the house, smoking intensity and intention to quit, using bootstrapped χ^2 tests. Finally, we commented on the similarity of the rankings from our sample with the results from research in Australia undertaken prior to the introduction of the current policy.[6]

RESULTS

Six of the licensed Australian warnings (figure 1) provided messages of personal health consequence that could result from smoking cigarettes ('peripheral vascular disease (gangrene)', 'teeth damage', 'blindness', 'throat cancer', 'emphysema', or 'stroke'), one warned of harm to unborn babies, and one encouraged the consumer to quit smoking.

In figure 2 we display the distribution of respondents' choices for the images perceived to be most effective in the entire sample and across sociodemographic subsegments. In our sample, three images accounted for 71% of the choices for the most effective image. These were: gangrene (32%), harm to babies (23%) and throat cancer (16%). Only 1% chose the image of a woman who was supposed to have had a stroke.

Although the observed distribution of choices for all eight images varied significantly by age and race (p's≤0.002), the top three choices were very similar. The per cent of each subsegment choosing either 'gangrene', 'harm to babies', or 'throat cancer' as the most effective ranged from a low of 65% among respondents who scored a 4 or 5 on a seven-point scale measuring intentions to quit to a high of 82% among non-white respondents.

DISCUSSION

Using a stated preference methodology, we identified that the rankings of the eight Australian graphic images did not vary substantially across subsegments of US adults. The finding that the gangrene image was chosen as the most effective is consistent with findings from preimplementation focus groups in Australia.[6] These Australian data indicated that many individuals found this image effective even though they did not rate it very highly on a 'believability' scale, suggesting the warning might be viewed as an advocacy-based message.

Our results are specific to cigarette users and may not generalise to other population groups. Yet, the consistency of our results across subsegments and with Australia's earlier more expensive studies gives confidence in the ranking of perceived effectiveness. Our methodology provided low-cost, actionable design insights in near real-time (the data were returned in <6 hours). Such approaches may aid future efforts to design cigarette warning labels or other health education material.

Figure 1 Eight of the images and warning messages that are currently implemented on cigarette packages in Australia. These images are reprinted with permission from the Commonwealth of Australia.

Socio-Demographic Characteristics		N	Gangrene	Baby	Throat Cancer	Emphysema	Teeth Damage	Blindness	Ashtray	Stroke	P-Value
Total Sample		403	32%	23%	16%	13%	7%	4%	4%	1%	< 0.001
Education	≥ Bachelors	179	32%	22%	17%	12%	8%	4%	3%	2%	0.99
	Some College	164	31%	25%	15%	13%	7%	4%	4%	1%	
	≤ High School	60	34%	24%	17%	14%	5%	2%	5%	0%	
Age	40 to 49	70	29%	23%	17%	20%	3%	3%	3%	3%	0.002
	30 to 39	162	22%	25%	20%	14%	11%	6%	1%	1%	
	18 to 29	171	43%	22%	11%	9%	5%	2%	6%	1%	
Gender†	Male	244	37%	26%	12%	12%	6%	2%	5%	1%	0.22
	Female	154	29%	22%	18%	14%	8%	5%	3%	2%	
Race	White	310	34%	18%	16%	14%	8%	5%	4%	1%	<0.001
	Non-White	93	24%	43%	15%	9%	5%	1%	2%	1%	
Lives with a child who is ≤ 5 years old?	Yes	67	24%	36%	13%	12%	6%	4%	1%	3%	0.22
	No	336	33%	21%	16%	13%	7%	4%	4%	1%	
Smoking Frequency	Daily	235	30%	21%	18%	14%	8%	4%	3%	2%	0.50
	Non-daily	168	35%	27%	13%	12%	7%	3%	4%	1%	
Chance of quitting in the next 3 months (1=No chance to 7= Certain)	1 to 3	181	35%	23%	17%	14%	6%	2%	3%	1%	0.47
	4 to 5	147	27%	23%	15%	12%	10%	7%	5%	2%	
	6 to 7	75	35%	25%	16%	13%	7%	1%	1%	1%	

Figure 2 The probability of selecting each image as the most effective in the entire sample and across various sociodemographic subsegments. Notes: The values in each cell are the probability or conditional probability of selecting each image for the corresponding sociodemographic characteristic. Darker blue corresponds with a higher probability selecting an image. All column headings correspond with the images in figure 1; 'Non-White' includes all respondents who identified as being Mexican American, African American, Asian and all other racial/ethnic categories except 'White'; 'Daily Smoker' includes those who reported smoking 7 of the 7 days before taking the survey; 'Non-Daily Smoker' includes those who reported smoking 1–6 of the days in the 7 days before the study. †Five responses were excluded from the gender comparison because they did not identify their gender (N=398).

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