

**Dissuasive Cigarette Sticks: The Next Step in Standardised ('Plain') Packaging?**

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## **A B S T R A C T**

**Background** Standardised (or 'plain') packaging has reduced the appeal of smoking by removing imagery that smokers use to affiliate with the brand they smoke. We examined whether changing the appearance of cigarette sticks could further denormalise smoking and enhance the impact of standardised packaging.

**Methods** We conducted an on-line study of 313 New Zealand smokers that comprised a best-worst choice experiment and a rating task. The best-worst experiment used a 2x3x3x6 orthogonal design to test the following attributes: on-pack warning message, branding level, warning size, and stick appearance.

**Results** We identified three segments whose members' choice patterns were strongly influenced by the stick design, warning theme and size, and warning theme, respectively. Each of the dissuasive sticks tested was less preferred and rated as less appealing than the most common stick in use; a 'minutes of life lost' stick was the most aversive of the stimuli tested.

**Conclusions** Dissuasive sticks could enhance the effect of standardised packaging, particularly among older smokers, who are often more heavily addicted and resistant to change. Countries introducing standardised packaging legislation should take the opportunity to denormalise cigarette sticks' appearance in addition to removing external tobacco branding from packs and increasing warning size.

## INTRODUCTION

Despite tobacco control measures restricting mass media advertising, tobacco packaging remains a powerful marketing medium that continues to communicate aspirational brand imagery.[1] This imagery connotes appealing attributes, positions brands as conduits through which smokers can access and adopt desirable characteristics, and elicits high brand loyalty among smokers, who value the distinctive attributes “their” brand connotes.[2-4] Social identity theory (SIT) recognises how individuals identify with people who share common behaviours that support the group’s public identity,[5] and explains how brand affiliations enable initiating smokers to access, assume, and communicate a desired group identity.[6]

Tobacco packages, as the key carriers of brand imagery, play a crucial role in defining and communicating these identities and are now such an obvious form of residual marketing that several governments have announced their intention to implement standardised (or ‘plain’) packaging. Although described as ‘plain’ or ‘standardised’, tobacco packages devoid of branding imagery are actually dissuasive because design elements are not simply removed, but replaced by aversive colours and larger warning images.

In Australia, standardised packaging has been mandatory since late 2012,[7] when the Tobacco Plain Packaging Bill 2011 and Trade Marks Amendment (Tobacco Plain Packaging) Bill 2011 came into effect. These statutes restricted tobacco companies’ ability to communicate the visual brand attributes they previously used to attract new smokers and retain those already addicted to smoking.[1, 3, 4, 6] Australia’s standardised packaging law also limits the appearance of cigarette sticks by requiring these to be white only, with a tan or white filter tip. Companies may place an alpha-numeric code on sticks for recall purposes; however, these codes may not relate to the brand in any way. Since Australia’s initiative,

other countries have either passed legislation to implement standardised packaging (Ireland, the UK and France) or begun the legislative process (Finland, New Zealand and Norway).

As yet, however, no country has attempted to de-market smoking either by reducing the visual appeal of cigarette sticks or by using them to communicate health warnings. Given the tobacco industry's extensive use of cigarette sticks to appeal to specific smoker sub-groups,[8-12] the lack of regulatory attention to this marketing vehicle is surprising. Formerly secret tobacco industry documents show deliberate targeting of young women as tobacco companies used designer tipping and slimmer, elongated cigarettes to create connotations of glamour and femininity,[13] and reduced harm.[8,9] Even today, adolescent smokers and non-smokers see white-tipped, slim, embellished cigarettes as more attractive and less harmful.[10,14]

The Virginia Slims story, as told by advertising agency Leo Burnett's Creative Director Hal Weinstein, exemplifies the role cigarette sticks play in creating desirable brand personalities.

Weinstein stated: "*This thin cigarette, we discovered, had visual intrigue. It looks quite different – fascinating - in your hand and in your lips. It has style and grace. It's neat.*

*Somehow it's very flattering, distinctive.* [BATES NO. 0002430031]".[15] As Weinstein made clear, cigarette sticks have important marketing potential: while smokers may *display* their branded tobacco packages, they actually *consume* cigarette sticks.

Recent studies have highlighted the potential dissuasive sticks may play in reducing the appeal of smoking. Printing public health warnings on sticks increased quit intentions among adult smokers,[11] while young women found a stick featuring the warning "smoking kills" off-putting and embarrassing to smoke in public.[16] Adolescents disliked a dark brown stick,[10] and young adult female smokers found dark green and yellow-brown sticks

aversive.[14] These reactions suggest discrepancies between how smokers expect a cigarette to appear and its actual appearance can disrupt learned associations and cause discomfort. We explore this reasoning further in the following section.

### *Cognitive Dissonance and Cue Consistency*

Theoretically, the unattractive colours used in standardised packaging give rise to dissonance that undermines the benefits smokers gain from smoking.[17, 18] For many years, marketers have recognised that colours create heuristics that simplify brand recognition, denote physical product attributes, and create connotations that shape consumers' experiences. [18-20] While colours traditionally create positive connotations, the dissuasive colours used in plain packaging challenge smokers' anticipated experiences.[3] For example, the murky green colour used on Australia packaging evokes feelings of disgust that are sharply inconsistent with the connotations smokers wish to access.[14] Using unappealing colours on sticks themselves could thus elicit powerful affective responses, evoke negative connotations, and reinforce the regret many smokers experience.[18, 21, 22]

On-pack health warnings also create an unsettling tension that challenges industry attempts to frame smoking as one of many slightly risky behaviours people may adopt.[23] Sticks featuring warning messages could amplify these tensions as unavoidable warnings would challenge the self-exemptions many smokers use to reduce dissonance. The resulting disquiet could increase the regret most smokers experience,[21] intensify the effects standardised packaging has on denormalising smoking, and cue cessation. Furthermore, visually depicting smoking as a tainted experience could mar the social identity smokers hope to create and thus deter initiation among adolescents and young adults, groups especially sensitive to social appearance.[24]

Evidence from Australia supports this reasoning. Since the introduction of standardised packaging, Australian smokers have reported diminished enjoyment from smoking and some believe the quality of the cigarettes they smoke has declined.[25] Yet while Australia has standardised the appearance of cigarette sticks, so these may not become de facto marketing platforms,[12] the new laws stopped short of requiring dissuasive sticks.

To test the potential of dissuasive sticks as a tobacco control intervention, we extended earlier studies examining stick appearance in three ways.[11] First, we employed a choice-based outcome measure to examine smokers' behaviour when presented with branded and plain cigarette packages containing different cigarette sticks. Second, we estimated how smokers rated the appeal of different stick options. Finally, we estimated responses to dissuasive sticks in the context of other standardised packaging attributes, and were thus able to estimate whether, and to what extent, dissuasive sticks would enhance standardised packaging.

## **Methods**

### **Sample**

The study involved an online survey of 313 self-defined daily smokers or intermittent smokers over the age of 18, recruited from the New Zealand Research Now panel. As 18 is the age at which tobacco may be legally purchased, we interviewed smokers whose buying behaviour may be influenced by stick appearance. Data were collected between 13 and 16 November 2014. The sample was stratified by age and gender to correctly represent the distribution of smokers in the New Zealand population. Panel members received an email inviting them to participate in a study that examined tobacco packaging. Once they had accessed the survey website, respondents were provided with an information sheet outlining

their rights as research participants. They then answered screening questions about their smoking status; those who were not self-defined daily or intermittent smokers were excluded from the study, as were former smokers. Panel members who completed the survey had \$2.00 added to their Research Now account, which allows redemption of the balance for a range of goods or donation to various charities. The project was reviewed and approved by a delegated authority of the University of Otago's Human Ethics Committee. Supplementary File 1 contains details of the overall sample characteristics.

### **Procedure and Instrument**

We used a Best-Worst (BWS) choice experiment that compared cigarette packs with different levels of branding, warning label themes, warning label sizes, and cigarette stick appearance, including four sticks deliberately designed to look unattractive (or dissuasive) to smokers.

BWS experiments have several advantages over traditional intentions and ranking measures; they produce an ordinal ranking of items for each respondent and ratio scale estimates of each attributes' attractiveness. The resulting estimates of preference strength for each option may be compared across respondents and avoid the indeterminacy of rating scales.[26, 27]

The attributes tested drew on the strong evidence that reducing on-pack brand imagery and simultaneously increasing the pictorial warning size decreases smoking's appeal.[2, 22, 28-30] The experimental design included an option analogous to the existing New Zealand front-of-pack, which currently features a pictorial warning covering 30 percent of the pack surface, and featured the stick most commonly sold in New Zealand (brown filter with a white stick). We used the same brand name, 'Kool', in all choice options. Because Kool is not available in New Zealand, this approach removed residual brand loyalty effects that could otherwise have influenced respondents' choices.

Two of the dissuasive sticks tested (coloured slim y green and faecal yellow-brown) were chosen from a sample of 20 coloured sticks tested in a previous qualitative study,[14] while two sticks displayed warning messages. The first of these stated 'smoking kills', the most direct on-pack warning message currently used in New Zealand, while the second used a graphic depicting '15 minutes of life lost' and partially replicated a stimulus used in an earlier study.[11] The remaining two sticks were a standard white with brown filter tipped stick (the 'typical' stick, which we used as a reference) and a white stick with a white filter tip (the 'feminine' stick).

### **Experimental Design**

The choice experiment involved a 2 x 3 x 3 x 6 orthogonal design with attribute levels shown in Table 1 below. This design gave 108 choice sets; to reduce respondent burden, we divided the total number of choice sets into nine blocks of 12 choice sets. Respondents were asked to imagine they had gone into a store to buy cigarettes or tobacco and the only options available were the ones they were about to be shown, which were all available at the same price. Each respondent evaluated one randomly-chosen block of choice sets (comprising 12 randomly-presented choice sets) and for each set was asked: "Which of these packs would you be most likely/least likely to buy?". Respondents could view choice sets for as long as they wished. Figure 1 shows one choice set that illustrates the packs tested, each of the three branding levels, and three of the test sticks.



**Table 1: Choice Experiment Experimental Design**

<b>Attribute</b>	<b>Levels Tested</b>
Warning theme	Social – teeth replaced with burning cigarettes Health – a cancerous tongue
Branding level	Branded (a fully branded pack) Plain pack with brand logo Fully plain pack (following the Australian model of a dissuasively coloured background with a standardised brand name)
Warning size	30% of Front of pack 50% of Front of pack 75% of Front of pack
Stick Appearance	Typical (Brown tip) Feminine (White tip) Text on stick “Smoking Kills” Text on stick “Minutes of life lost shown graphically” Faecal yellow-brown Slimy green

**PLEASE TAKE IN FIGURE 1 ABOUT HERE**

**Figure 1: Examples of packs and cigarettes tested**

Respondents then viewed the six cigarette sticks, presented individually and in a random order, and rated each stick’s appeal on a scale of -5 to +5, where -5 = very unappealing and +5 = very appealing, with a mid-point of zero. Finally, we collected details of respondents’ demographic attributes, including their age, gender, ethnicity and highest education level. We also measured whether they were daily or intermittent smokers, their level of addiction (using the number of cigarettes smoked per day and time to first cigarette to compute a Heaviness of Smoking Index; see Supplementary file 2 for details), and the type of cigarette smoked (manufactured or roll-your-own). Finally, we examined whether respondents had made a recent quit attempt and the likelihood they would make a quit attempt in the next six months (using an 11-point probability scale).

## **A n a l y s e s**

We analysed the Best-Worst scores by estimating a sequential Best-Worst Choice model with 'Most likely to choose' and 'Least likely to choose' as the dependent variables, while the independent variables were stick appearance, warning theme, warning size and branding level. By applying Scale-Adjusted Latent Class Modeling (SALCM) we identified a statistically defensible number of preference and scale classes from the choice experiment data. A recent development in discrete choice experiments, SALCM recognises that respondents may differ in their preferences for the options presented as well as in their choice consistency, or both. The use of SALCM in analysing choice experiment data is described in earlier work.[31]

Using the stick appeal data, we calculated mean values for each stick; we then compared these means to rank the sticks by perceived appeal before examining whether appeal varied by different demographic or behavioural attributes. We used t-tests and ANOVA in SPSS V22 to conduct these tests.

## **R e s u l t s**

Respondents were less likely to select each of the four sticks designed to look unattractive – the yellow-brown and green coloured sticks, and the sticks featuring either the 'smoking kills' message or a graphic illustrating the 'minutes of life lost' while smoking – than either of the two sticks in current use (the 'typical' or 'feminine' sticks). Respondents also found the test sticks significantly less appealing than both existing sticks, particularly compared to the brown filter reference stick. Table 2 outlines the results from both experiments and shows the patterns are virtually mirror images of each other.

**Table 2: Best Worst and Stick Appeal Results**

Stick Appearance	Best-Worst Study – Aggregate Analysis <sup>1</sup>		Stick Appearance Study	
	Odds Ratio for Choice <sup>2</sup>	95% CI	Mean Score <sup>3</sup>	95% CI
	1.00	Reference	2.66	2.41–2.91
	0.42	0.36–0.48	1.13	0.86–1.39
	0.36	0.31–0.42	-0.95	-1.24 – -0.67
	0.29	0.24–0.34	-0.80	-1.09 – -0.50
	0.27	0.23–0.32	-0.89	-1.23 – -0.56
	0.21	0.18–0.25	-1.32	-1.65 – -1.00

1. Sample size for analysis n = 308 due to missing values.

2. All odds ratios significant at p<.05; based on ‘most likely to buy’ and ‘least likely to buy’ choices.

3. On an 11-point scale from -5 = Very Unattractive to +5 = Very Attractive

Respondents were least likely to select an option where the stick featured the ‘minutes of life lost’ graphic. Relative to the ‘typical’ stick (the most common and most preferred stick), the ‘minutes of life lost stick was 80% less likely to be chosen (OR = 0.21) and nearly four scale points less appealing (-1.32 cf. 2.66). Respondents were significantly less likely to choose the other three test sticks relative to the ‘typical’ stick and found the test sticks significantly less appealing than either of the sticks in current use (‘typical’ or ‘feminine’).

**The effect of demographics on stick appearance ratings**

We examined the mean appeal ratings for each stick by self-defined smoker group (daily or intermittent), gender, ethnicity and age. Table 3 contains these results (95% confidence intervals for the means in this table are provided in Supplementary File 3).

**Table 3: Effect of Demographics on Stick Appeal Ratings**

Stick Appearance	Mean Appeal Rating <sup>1</sup>								
	Daily Smoker (n = 249)	Intermittent Smoker (n = 64)	Male (n = 155)	Female (n = 158)	European/ Other (n = 284)	Maori/ PI (n = 29)	18-34 (n = 115)	35-54 (n = 132)	55+ (n = 66)
	Typical	2.70	2.52	2.42	2.90	2.66	2.65	2.62	2.57
Feminine	1.35	1.09	0.88	1.37*	1.19	0.49	1.48	0.99	0.78
Smoking Kills	-0.81	-1.49*	-0.77	-1.12	-0.93	-1.21	-0.57	-0.96	-1.61**
Yellow-Brown	-0.94	-0.24*	-0.39	-1.20**	-0.76	-1.13	-0.71	-0.71	-1.13
Slimy Green	-1.02	-0.77**	-0.39	-1.38**	-0.91	-0.75	-0.44	-0.93	-1.61**
Life Lost	-1.16	-1.96*	-1.12	-1.53	-1.30	-1.55	-1.01	-1.28	-1.96

1. On an 11-point scale from -5 = Very Unattractive to +5 = Very Attractive

\*Difference between groups significant at  $p < .10$ . \*\*Difference between groups significant at  $p < .05$ .

Intermittent smokers' rating of the 'smoking kills' and 'minutes of life lost' sticks was significantly lower than daily smokers' scores; daily smokers had higher (though still negative) ratings for the green and yellow-brown sticks. Women rated all of the dissuasive sticks as less appealing than did men; these differences were significant for the green and yellow-brown sticks. Women also gave significantly higher scores than men to the white (feminine) sticks. Older people – those 55 and over – also rated all of the dissuasive sticks as less appealing than did younger people, particularly the 'Smoking Kills' and green sticks. Māori rated the 'smoking kills', 'minutes of life lost' and yellow-brown sticks as less attractive than did European or other smokers, though none of these latter differences were statistically significant.

### Preference Segments

The Scale Adjusted Latent Class Modelling approach allowed us to estimate a Sequential Best-Worst Choice model with three preference classes and two scale classes. These classes, or segments, reflect respondents' choice patterns and the consistency of their choices across choice sets. Scale class 1, to which 27% of respondents belonged, displayed more

inconsistent choice patterns; i.e., their choices were more random. Respondents belonging to scale class 1, were more likely to be younger ( $p < 0.05$ ) or middle aged ( $p < 0.1$ ), or to have a medium level of education ( $p < 0.01$ ). By contrast, the consistent scale class 2 was more likely to include older respondents ( $p < 0.01$ ), respondents with a lower education level ( $p < 0.05$ ), and respondents with a higher quit intention ( $p < 0.05$ ).

The Wald tests for the importance of all attributes (branding level, warning theme and size, and stick appearance) were significant at  $p < 0.001$ , indicating that each attribute significantly influenced respondents' choices. Figure 2 illustrates the relative importance of each attribute to each preference class and shows how influential each attribute was on respondents' choice patterns. To examine which sticks respondents preferred, we compared the average odds-ratios across preference segments; Figure 3 contains these results. Finally, to examine whether stick preference was related to any of the independent variables measured, we compared the characteristics of each preference segment identified by the Scale Adjusted Latent Class Model; Table 4 contains these findings.

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**Figure 2: Relative attribute importance by preference class**

Figure 2 shows that members of preference segment one (36% of the sample) were influenced most by stick appearance, while members of segment three (31% of the sample) were less influenced by stick appearance but more by the warning theme. Segment 2 members (33% of the sample) were equally concerned about warning size and warning theme, and less concerned about stick appearance. All segments were less influenced by

branding level but, as we explain later, this finding is likely to reflect the unfamiliar brand used.

Figure 3 and Table 4 show that the aggregate results in Table 2 mask differences between the different preference segments; specifically, preferences for the four sticks designed to look unattractive vary considerably. Segment 1, whose members were most influenced by stick appearance, had a very strong preference for the 'typical' stick and strongly disliked the appearance of all other sticks tested ( $p < 0.01$ ). By contrast, segment 2, whose members responded more strongly to the warning size and warning theme attributes, particularly disliked the 'minutes of life lost' sticks ( $p < 0.01$ ). The 'smoking kills' ( $p < 0.01$ ), faecal yellow-brown ( $p < 0.01$ ), and feminine ( $p < 0.01$ ) sticks all had a strong dissuasive effect on segment 3, the segment whose choice patterns were influenced most by the warning theme presented.

#### **PLEASE TAKE IN FIGURE 3 ABOUT HERE**

#### **Figure 3: Odds-ratios showing stick preferences by preference class**

As Table 4 shows, the preference classes, or segments, also differed in their demographic and behavioural characteristics. Segment one was less likely to include respondents from the middle age group, but more likely to include older respondents and marginally more likely to include New Zealanders of European descent. By contrast, segment two was more likely to include moderate or light smokers, with medium education and marginally higher than average quit intentions, and who smoked 'roll your own' cigarettes. Members of segment 3 were more likely to be middle aged, light smokers, and daily rather than intermittent smokers,

with significantly lower quit intentions. Overall, Table 4 illustrates how the segments differ in their stick preferences as well as in some demographic and behavioural characteristics.

**Table 4: Characteristics of preference segments**

Characteristic <sup>1</sup>	Segment 1	Segment 2	Segment 3
<b>Segment size</b>	36%	33%	31%
	<b>Odds Ratios</b>		
<b>Stick Appearance</b>			
Typical	1.00	1.00	1.00
Feminine	0.25***	0.52	0.48***
Smoking kills	0.11***	0.58	0.28***
Faecal yellow-brown	0.05***	0.56	0.41***
Slimy green	0.03***	0.73	0.76
Minutes of life lost	0.02***	0.45***	0.28
	<b>Share by Characteristic (%)</b>		
<b>Gender</b>			
Female	39	32	29
Male	32	35	33
<b>Age Group</b>			
18 to 34	37	38	26
35 to 54	29***	33	38**
55 and older	49***	27	25
<b>Ethnicity</b>			
NZ European/Other	33*	35	32
Maori/Pacific	48	35	17
Asian	43	25	33
<b>Education</b>			
Low	37	32	32
Medium	33	44**	23
High	38	25	38
<b>Smoking Status</b>			
Intermittent smoker	34	36	29*
Daily smoker	36	33	31*
<b>Heaviness of Smoking Index</b>			
Light	36	26**	38**
Moderate	39	41**	21***
Heavy	29	33	38
<b>Cigarette Type</b>			
Roll your own	34	34*	32
Tailor made	39	33*	29
<b>Recent Quit Attempt</b>			
No	34	34	32
Yes	39	33	29
<b>Quit Intention</b>			
Mean	6.3	6.5*	5.2***

1. Totals may not sum to 100 percent due to rounding errors

\*Odds ratio/percentages significant at  $p < .1$ .

\*\*Odds ratio/percentages significant at  $p < .05$ .

\*\*\*Odds ratio/percentages significant at  $p < .01$



## Discussion

Our study is the first to compare cigarette sticks that communicate verbal warning messages or feature unattractive colours with the status quo, and to estimate the likely effects dissuasive sticks could have on smokers' behaviour. Regardless of the measure used (perceived appeal or choice preferences) the test sticks were less attractive than the brown filter tip sticks most commonly sold and used as our control option. The stick featuring the 'minutes of life lost' graphic was markedly less appealing and less likely to be chosen than all other sticks tested. This stark graphic representation of smoking's effects provided a striking contrast to the sanitised, white sticks that disguise the tar and carcinogens smoking delivers.[14] Respondents also avoided sticks presented in colours that evoke dirt and filth, damage the social façade smokers construct, and fuse smoking with unavoidably unpleasant connotations.[19]

Our results show that different preference segments respond differentially to standardised packaging components. Evidence that a third of the sample was highly responsive to stick appearance suggests introducing dissuasive sticks alongside standardised packaging could contribute to a comprehensive smoking denormalisation strategy. Dissuasive sticks could reach a group less responsive to other components of standardised packaging and increase the likelihood that this policy will influence all sub-groups within the wider smoker population.

These findings are consistent with evidence from tobacco industry documents and earlier experimental studies that revealed the importance of external packaging and brand livery to smokers.[1-3, 25, 28, 29] Cigarette sticks continue associations developed by external packaging and provide a distinct, and previously unregulated, marketing platform. [10-12].

While external branding creates a social identity, clean, attractive cigarettes enable smokers

to defy the stereotypes that confront them in increasingly denormalised environments.[3, 14]

Decades of tobacco marketing have entrenched the valued identities that clean, white sticks help construct and reinforce,[1] but aversive sticks disrupt these associations and undermine smokers' ability to manage the dissonance many experience.[14, 18, 21]

Although earlier studies have found women prefer slim white sticks,[10, 14] female respondents in our study were more likely to choose the typical brown-filter stick over the white-filter option, and found the former more appealing than the latter. We surmise this unexpected result may reflect respondents' preference for their own brand's appearance, given brands using brown-filter tip sticks dominate the New Zealand market. However, without details of respondents' current brand, we cannot test this explanation.

Our study has some limitations. First, while choice studies move closer to the behavioural end of the outcome spectrum, they do not measure actual behaviour. Second, our use of an unknown brand – 'Kool' – may have depressed responses to the branding attribute as respondents will have lacked the emotional connection to 'Kool' they would experience for their own brand. We drew a sample from an online panel which, while matched to the New Zealand population, is nonetheless not a simple random sample of smokers. Finally, the smaller cell sizes in some comparisons reduced the power to detect significant differences.

Future research could take two directions to address these limitations. First, it could increase the external validity of our study by developing manipulations that apply directly to smokers' own brands. This approach would recognise brand loyalty effects and allow interactions between brand loyalty and aversive sticks to be estimated. A second approach could use a naturalistic setting and an ecological momentary assessment approach to obtain real-world

data. Such an approach could estimate changes in tobacco consumption, including smoking levels, smoking in social settings, and cessation intentions and attempts [32].

While we used colours regarded as strongly aversive in an earlier qualitative study, [14] colour perceptions often reflect cultural norms; [20] future research could thus examine whether alternative stick colours (or shapes) may have more dissuasive effects in other settings. Such studies could also expand the samples examined beyond young adults, for example by exploring how younger adolescents perceive and respond to dissuasively coloured sticks.

From a policy perspective, dissuasive sticks could complement and extend plain tobacco packaging. [10, 12, 18] For countries now preparing plain packaging legislation, our findings offer an important opportunity to build on what Australia has achieved and take smoking denormalisation to a new level. Measures requiring sticks to represent the reality of smoking could create a dissonance that undermines the connotations and social identities to which young women, in particular, aspire. [14, 17, 33]

## **Conclusions**

Our findings suggest that cigarette sticks featuring warning messages or appearing in unattractive colours could enhance the effects of plain packaging, and further reduce any residual appeal smoking has to young people. By undermining smokers' attempts to separate their behaviour from its consequences, aversive sticks could play a powerful role in reframing smoking as a dangerous and distasteful behaviour. Given smokers seek product attributes that maintain a desirable social persona while they consume a fundamentally "dirty" product, dissuasive sticks could dismantle important rationalisations that sustain continued smoking.

For smokers already regretting their addiction to a product that has become socially unacceptable, unappealing sticks may amplify feelings of dissonance in the same way that plain packaging diminishes the perceived and actual experience of smoking. Including discordant cues such as dissuasive sticks in plain packaging legislation would challenge the increasingly fragile identity smokers wish to preserve and potentially create a powerful stimulus that also deters initiation.

#### **A c k n o w l e d g e m e n t s**

We thank Julie Jeon, the graphic artist who prepared and refined the test stimuli.

#### **W h a t t h i s p a p e r a d d s**

- Evidence from Australia shows that standardised packaging has successfully reduced the appeal of smoking among both smokers and non-smokers.
- Emerging evidence suggests cigarette sticks that feature warning messages could also reduce the appeal of smoking among smokers.
- We tested four cigarette sticks that either communicated verbal warnings or featured unattractive colours; smokers were significantly less likely to choose the test sticks and found all significantly less appealing than the status quo – a white cigarette with a brown filter tip.
- A “minutes of life lost” graphic had the strongest dissuasive effect relative to the other sticks tested.
- Requiring cigarette sticks to feature a “minutes of life lost” graphic or unattractive colours would increase standardised packaging’s impact on smokers.

### **Competing interests**

Although we do not consider it a competing interest, for the sake of full transparency we note that some of the authors have previously undertaken work for health sector agencies working in tobacco control.

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### **Contributions**

JH conceptualised and designed the project, and obtained research funding. With PG, she designed the questionnaire and oversaw the data collection; JH led the MS development and, with PG, responded to the reviewers' suggestions. PG undertook the initial data analyses and developed the results section of the MS. JL designed the choice experiment; CE and JL analysed the choice data; CE prepared figures used in the MS. All authors have seen and approved the final version; JH is guarantor of the MS. Authors are listed in descending order of contribution.

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