

# Which types of anti-smoking television advertisements work better in Taiwan?

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## Summary

Research in high income countries suggests that anti-smoking television advertisements with emotionally evocative graphic messages or personal testimonials that depict serious consequences from smoking are the most effective. Research to determine the most effective smoking cessation messages for low- and middle-income countries is needed to inform campaign development in these countries. Fifty-four male Taiwanese smokers, aged 18–34, rated advertisements and participated in a focus group to evaluate eight antismoking television advertisements with contrasting messaging strategies. Participants individually evaluated advertisements, after which they participated in a semi-structured focus group discussion (10 groups, 2–9 smokers per group). One week after this session, participants were called to assess advertisement recall. Both quantitative and qualitative data indicated that highly emotional testimonial ads that featured a graphic portrayal of personal suffering from the consequences of smoking and visceral graphic ads were more effective. The ad on tobacco industry denormalization that focuses on the responsibility of the industry for smoking-related harms was considered ineffective because smokers perceived it as having little personal relevance. Humorous advertisements were evaluated as the least effective because they lacked strong emotional content linked to smoking consequences. Qualitative results suggest that advertisement characteristics are more important than the demographic characteristics of people featured in advertisements. Study findings provide preliminary evidence that testimonial ads that involve graphic and emotionally evocative portrayals of smoking-attributed diseases and visceral graphic ads may have the greater potential to motivate Taiwanese smokers to quit smoking.

**Key words:** tobacco smoking, health communication, anti-smoking television advertisements, low/middle income country

## INTRODUCTION

Research in high income countries (HICs) suggests that anti-smoking advertisements (ads) that emphasize smoking harms through graphic imagery and/or by promoting strong negative emotions outperform messaging styles that do not include these elements (National Cancer Institute, 2008; Dunlop *et al.*, 2012; Durkin *et al.*, 2012). Highly emotional testimonial ads that portray people describing how their lives or loved ones' lives are affected by smoking-related diseases are also rated as effective and prompt thoughts of quitting (National Cancer Institute, 2008; Durkin *et al.*, 2009; Davis *et al.*, 2011; Durkin *et al.*, 2011; Wakefield *et al.*, 2011; Dunlop *et al.*, 2012). Evidence is more mixed on the effectiveness of cessation ads that focus on tobacco industry manipulation of smokers (Thrasher and Bentley, 2006; National Cancer Institute, 2008; Malone *et al.*, 2012), with stronger evidence for the effectiveness of industry manipulation messages in preventing smoking among youth (Thrasher *et al.*, 2004; Farrelly *et al.*, 2005; Thrasher and Jackson, 2006; Thrasher *et al.*, 2006; Farrelly *et al.*, 2009) and young adults (Hammond *et al.*, 2006; Ling *et al.*, 2007, 2009). However, research on smoking cessation messaging strategies has been conducted almost exclusively in Western HICs (Durkin *et al.*, 2012; Malone *et al.*, 2012), and it is critical to determine which strategies work best in low- and middle-income countries (LMICs) that increasingly bear the global burden of tobacco-related disease (World Health Organization, 2011).

The translation of tobacco control media strategies to LMICs has recently begun to emerge (Murukutla *et al.*, 2011; Thrasher *et al.*, 2011; Wakefield *et al.*, 2011; Mullin *et al.*, 2013; Thrasher *et al.*, 2013). Ads with graphic emotional appeals that portray serious consequences of smoking are rated as effective by smokers across a variety of LMICs (Wakefield *et al.*, 2011). However, some specific messaging strategies, such as tobacco industry manipulation, remain understudied within LMIC contexts (Malone *et al.*, 2012). Costs and expertise required for pretesting and producing effective cessation ads may be prohibitive for many LMICs, and the adaptation and use of existing, evidence-based materials produced in other countries may help maximize campaign effectiveness (Wakefield *et al.*, 2011).

### The Taiwanese context

Smoking prevalence among Taiwanese adult males over 18 years old has significantly decreased from 59.4% in 1990 to 33.5% in 2011 owing to strong tobacco control efforts; nevertheless, this prevalence is still 1.6 times higher than in Western HICs (Bureau of Health

Promotion, Taiwan's Department of Health, 2012). The Taiwan Ministry of Health and Welfare and the John Tung Foundation, Taiwan's leading anti-smoking organization, have invested a significant amount of resources in national-level anti-smoking mass media campaigns for the past two decades (Chen *et al.*, 2004; Bureau of Health Promotion, Taiwan's Department of Health, 2005); however, these campaigns usually do not use graphic, emotionally evocative messages but positive, humorous messages or less graphic and emotionally evocative messages. Furthermore, insufficient campaign evaluation has not allowed determination of their effects to inform future campaign strategies (Bureau of Health Promotion, Taiwan's Department of Health, 2005). Studies have not examined ads that vary significantly in messaging content and style, and the ads they evaluated lacked the strong graphic messages that are consistently found to be effective.

According to Elaboration Likelihood Model (ELM), people process persuasion messages through two distinct routes. When people are motivated and able to process a message, they tend to engage in 'central route', where attitudes are formed and influenced through thoughtful engagement with message arguments. 'Peripheral route' processing, where attitudes are influenced by peripheral cues (e.g. emotional content, credibility), is likely to occur when people are less motivated or able to process a message (Petty and Cacioppo, 1984; Petty *et al.*, 2002). These pathways are not mutually exclusive and adopting one route over the other may vary over time, partly due to changes in motivation and ability to process messages (Chaiken, 1980). Enhancing message relevance through the use of testimonials or narratives with which people can identify can promote central processing, producing greater desirable behavior change (Kreuter and Wray, 2003; Rimer and Kreuter, 2006), but people may also reject messages if they do not perceive them as credible.

Ads generally must be understood and recalled in order to influence beliefs and behaviors thereafter (Agostinelli and Grube, 2003). The affective processing of message content and style influences recall and cognitions, which in turn influence behavioral intentions that mediate campaign effects on smoking cessation behaviors (Agostinelli and Grube, 2003). Testimonial or narrative approaches that focus on real people's experiences can facilitate comprehension and recall of cancer-related messages (Green, 2006) and elicit greater emotional arousal than informational messages (McQueen *et al.*, 2011). Moreover, narrative messages that elicit stronger negative affective responses can generate greater message elaboration and involvement than those that do not (Green and Brock, 2000). Based on the above theoretical rationales and

empirical evidence, we posit that ads with strong graphic imagery or highly emotional testimonials will be perceived as more effective, more believable, more personally relevant and arouse greater negative emotions than ads lacking these elements.

The aim of the current study is to answer our research question using a mixed qualitative and quantitative method: what content and style of anti-smoking ads do Taiwanese smokers think most motivate them to quit smoking? Ads were selected based on contrasting ad content and style (i.e. testimonials, graphic portrayal of smoking-related diseases and level of negative emotional arousal). The results will help determine whether the most effective ads appear differently in Taiwan than in other countries.

## METHODS

### Study design

This study used a mixed qualitative and quantitative data collection method that includes an individual paper-and-pencil, self-administrated survey, focus groups and a follow-up telephone survey. Focus group methodologies are recommended for formative research (Uline *et al.*, 2005) and to evaluate or pretest health messages and advertising concepts (Goldman and Glantz, 1998; Schar *et al.*, 2006; National Cancer Institute, 2008; Best *et al.*, 2015; Friedman *et al.*, 2016). Individual ad ratings to measure perceived effectiveness are useful because it predicts actual changes in message-targeted attitudes and behaviors (Dillard *et al.*, 2007; Bigsby *et al.*, 2013; Brennan *et al.*, 2013). A follow-up phone survey was used to assess unaided ad recall to evaluate encoding of information into memory as often used to gauge ad effectiveness (Mehta and Purvis, 2006).

Smokers viewed and individually rated eight different anti-smoking television ads, after which they participated in a semi-structured focus group discussion about the ads, using a protocol adapted from Wakefield *et al.* (2011). One week after the focus group, a telephone call was made to each participant to assess which ads they recalled, which is a validated method for measuring memorability and engagement with ads (Terry-McElrath *et al.*, 2005).

### Study sample

The study took place in a southern city in Taiwan, where male smoking prevalence is lower than the national average (28.0% vs. 33.5%) (Bureau of Health Promotion, Taiwan's Department of Health, 2013). Only male

smokers were included for the study because substantially more males than females smoke in Taiwan (33.5% vs. 4.4% in 2011). Other eligibility criteria included aged 18–34 years; smoking at least 100 cigarettes in their lifetime; and having smoked at least once in the previous week. Data were collected between May 2012 and August 2012. Participants were recruited by flyers and prescreened for eligibility and then allocated to different groups based on their educational attainment (i.e. high school or less vs. more than high school) and quit intention (i.e. intend to quit in the next 6 months vs. not), thereby producing relatively homogeneous focus groups (Patton, 2002). Stratification of groups along these dimensions was done because smokers who have lower educational attainment or who have quit intentions rate anti-smoking ads as more effective than their counterparts (Wakefield *et al.*, 2011), and we wanted to capture a range of potential ad responses.

### Ad categorizations and selection

Based on theoretical rationales and empirical evidence, we selected ads that had contrasting content and style: (1) the use of testimonials or not; (2) graphic portrayal of smoking-related diseases or not; and (3) level of negative emotional arousal produced by ads, as presented in Table 1. 'Testimonial ads' feature real people who describe personal smoking-related experiences/diseases or how they or their families suffer from smoking (National Cancer Institute, 2008; Durkin *et al.*, 2009, 2011; Wakefield *et al.*, 2011). 'Graphic ads' show graphic imagery of bodily harms to organs or personal appearance (National Cancer Institute, 2008; Durkin *et al.*, 2009, 2011; Wakefield *et al.*, 2011). 'Highly emotional ads' express and elicit negative emotion such as discomfort, disgust, fear, anxiety or sadness (e.g. *Candle, Oral Cancer and Artery*) (National Cancer Institute, 2008; Durkin *et al.*, 2009, 2011; Wakefield *et al.*, 2011). Five ads were adapted from those found to be effective in their countries of production, as they used very graphic images, highly emotional testimonials, or tobacco industry manipulation. These ads were modified to include Chinese textual overlay. Two of these five ads maintained the English-language speech of the original version (*Oral cancer* and *Candle*) to convey the original voice and emotions of the testimonial. Two graphic ads were dubbed into Chinese (*Artery* and *Sponge*); the latter of which had already been broadcast in Taiwan. One ad did not include dubbing because it did not contain audio (*1200 dead*). Three additional ads had been produced and broadcast in Taiwan. These domestic ads were selected because they contrast with the other ads; that is,

**Table 1:** Characteristics and descriptions of the eight television ads

Content and style	Ad name (source)	Graphic portrayal	Negative emotion	Description of advertisement
Testimonial	Candle (CTCP)	Yes	High	A female cancer victim, Debi Austin, describes and shows her suffering from larynx cancer and vocal cords removal. She talks to the camera, warns people about the danger of smoking, and persuades people to quit before it's too late.
	Duo (TW)	No	Low	Two Taiwanese TV entertainers who suffer from multiple smoking-attributed cancers meet in a hospital and talk about their cancers and persuade viewers to quit smoking from getting cancers like them.
	COPD (TW)	No	Low	A Taiwanese tobacco control advocate speaks of his suffering from Chronic obstructive pulmonary disease (COPD) and encourages viewers to quit smoking. The ad portrays COPD patients have difficulty blowing balloon and provides specific scientific data regarding COPD caused by smoking.
	Oral cancer (HPB)	Yes	High	A woman played as an oral cancer victim speaks to the camera about the fact that smoking causes 92% of oral cancer in an emotionally evocative way. The woman's cancerous mouth is zoomed out from a graphic image of oral cancer on the cigarette warning label.
Graphic image	Sponge (WLF)	Yes	Low	A less strong graphic, simulation-type ad. It uses a visual metaphor of sponge to represent lungs and demonstrates tar inhaled and accumulated in lungs due to smoking.
	Artery (WLF)	Yes	High	A strong graphic and visceral ad. The image of squeezing fatty deposits from a diseased aorta autopsy evokes disgust from viewers. Artery provides a specific health message regarding cardiovascular heart disease caused by smoking.
Tobacco industry manipulation	1200 Dead (ALF)	No	Low	It is an ad staged with 1200 young people who play dead in front of a big tobacco company to portray the fact that tobacco products kill 1200 people a day in the US. One person remains standing, holding a sign that reads 'Tobacco Kills 1200 people a day' and 'Ever thinking about taking a day off?' on the other side.
Humor	Smile (TW)	No	Low	It uses a humorous approach to show the short-term cosmetic effects of smoking by placing the graphic warning image of cigarette packs regarding oral diseases on the mouth of people one by one. The ad tones down the long-term effects depicted on the warning label for oral diseases.

*Note:* CTCP: California Tobacco Control Program; TW: Taiwan Bureau of Health Promotion; WLF: World Lung Foundation; ALF: American Legacy Foundation; HPB: Singapore Health Promotion Board. All ads can be viewed at <https://www.dropbox.com/sh/6m4ipfyb246tesy/LtBWb6luWq> (last accessed on October 28, 2016).

they contained less graphic imagery and less emotionally evocative messages (*Duo* and *COPD*) or positive, humorous messages (*Smile*). All of the ads were 30 s in duration.

### Procedure and measurements

The initial questionnaire collected information about participants' socio-demographic characteristics, daily cigarette consumption and intention to quit in the next

6 months. Participants were then shown an ad on a large projector screen two consecutive times, after which they were asked to rate the ad. To minimize any potential effects of ad viewing order, groups viewed the eight ads in random order. The ad rating questions were modified from Wakefield and colleagues' rating scale that uses a set of ten ad-rating items measured on a 5-point Likert scale to indicate extent of agreement ('strongly disagree' = 1; 'strongly agree' = 5) (Wakefield *et al.*, 2011). Ratings assessed participant comprehension ('the ad is easy to understand'), novelty (i.e. 'the ad teaches me something new'), negative emotional arousal (i.e. 'the ad makes me feel uncomfortable'), credibility (i.e. 'the ad is believable'), personal relevance (i.e. 'the ad speaks to people like me') and perceived effectiveness of the ads (i.e. 'the ad makes me stop and think', 'makes me feel more concerned about smoking', 'makes me more likely try to quit,' 'I would talk to someone else about the ad' and 'the ad is an effective smoking cessation or anti-smoking ad'). The five-item perceived effectiveness (PE) scale had good reliability ( $\alpha = 0.79\text{--}0.87$  across ads) and were averaged. After all ads were rated individually, participants ranked the three ads that motivated them to try to quit smoking the most or least.

After these individual evaluations, focus group discussions were conducted by a moderator who used a semi-structured interview guide with nine questions similar to individual rating questions to explore participant comprehension, acceptability and perceived effectiveness of each ad individually as well as the relative effectiveness of ads. Finally, to assess the recall of the ads, one week after the focus group session each participant was called by telephone and asked to identify which, if any, of the eight ads they could recall without the aid of a cue or prompt. Participants were asked to recall up to three ads if they could.

### Data analysis

Quantitative analysis of ad ratings was performed using STATA, version 11.2 for Windows (StataCorp, 2009). Descriptive analyses were used to characterize the sample, ad ratings and recall. To assess relative performance of ads, we conducted a one-way repeated ANOVA omnibus assessment in ad ratings, using an exchangeable covariance structure to account for the dependence of individual responses (i.e. repeated measures). When ANOVA results indicated significant differences across ad ratings, post-hoc multiple comparisons were then conducted for all possible ad comparisons using Bonferroni correction procedures to adjust the significance level for

multiple tests (i.e.  $p < 0.002$ ). Qualitative data from focus group discussions were organized using NVivo, version 10 for Windows (QSR International, Victoria, Australia). Focus group transcripts were analyzed following five steps: reading the transcripts, coding the transcripts, displaying coded data, reducing data to essential points and interpreting the data (Maxwell, 2005; Uline *et al.*, 2005). Primary themes (Braun and Clarke, 2006) from focus group discussions were examined and compared with the quantitative individual data to determine the consistency of results, including effectiveness and content and style of ads.

## RESULTS

### Sample characteristics

Fifty-four male smokers participated in this study (10 groups, 2–9 smokers per group). The mean age of participants was 25 years (range = 18–34), 61% of participants had attained greater than high school education, the vast majority of them (91%) were daily smokers, almost half had tried to quit smoking in the last 12 months, and about half intended to quit in the next 6 months (Table 2).

### Quantitative findings: ad ratings and recall

One-way ANOVA results indicated that ad rating scores differed significantly across the eight ads [PE:  $F(7, 371) = 22.2, p < 0.001$ ; Comprehension:  $F(7, 371) = 6.4, p < 0.001$ ; Novelty:  $F(7, 371) = 13.8, p < 0.001$ ; Negative emotional arousal:  $F(7, 371) = 60.4, p < 0.001$ ; Credibility:  $F(7, 371) = 6.7, p < 0.001$ ; and Personal relevance  $F(7, 371) = 5.4, p < 0.001$ ]. The effect sizes were all large according to Cohen's principal (Table 3) (Cohen, 1969). Post hoc multiple comparisons showed that the *Oral cancer* ad had the highest PE score (PE = 4.0), significantly outperforming the three domestic ads (*COPD*, *Duo* and *Smile*) and the industry manipulation ad (*1200 dead*) ( $p < 0.05$ , Table 3). *Artery*, *Candle* and *Sponge* ads were rated as effective as the *Oral cancer* ad and received similar PE scores, which were significantly higher than the *Duo*, *1200 dead* and *Smile* ads. The *Smile* ad received significantly lower PE scores than any other ads except the *1200 dead* ad. *Oral cancer* had the highest score on emotion, significantly outperforming the other ads except *Candle*. *Oral cancer* also received significantly higher ratings on comprehension, credibility and relevance compared to *1200 dead* and *Smile* ads. Ranking data were consistent with rating results. *Oral cancer* was ranked as the best ad by over one-third (35%) of participants. *Artery*, *Candle* and

**Table 2:** Smoker characteristics

Characteristics	Number	Mean/Percent
Age (18–34 years)	54	25
Education		
High school education or less	21	39%
More than high school education	33	61%
Smoke status		
Smoke less than 1 cigarette per day	5	9%
Smoke 1–10 cigarettes per day	25	46%
Smoke more than 10 cigarettes per day	24	45%
Thinking about quitting in the next 6 months		
Yes	26	48%
Tried to quit in the last 12 months		
Yes	26	48%

*Sponge* were also frequently ranked among the best ads while *Smile* and *1200 dead* were among the worst ads.

For the follow-up recall survey, 94% ( $n = 51$ ) of participants were successfully reached by telephone. *Candle* ( $n = 18$ ), *Oral cancer* ( $n = 15$ ) and *Sponge* ( $n = 9$ ) were the ads that most participants first recalled. *Candle*, *Oral cancer* and *Artery* were the ads that most participants next recalled. *COPD*, *Duo* and *Smile* were the ads that were least reported in the recall task.

### Qualitative findings: focus group discussions

Qualitative responses to ads were basically supportive of overall quantitative ratings and provided further context for interpreting differences in ratings. Primary themes in relation to research questions are discussed below: comprehension, emotional arousal and relevance.

#### Comprehension

The most common comprehension difficulties reported by smokers were unfamiliar, complex medical terms (e.g. the COPD term presented in *COPD*), ambiguous metaphors for smoking-related disease (e.g. people having difficulty in blowing balloons represents their poor lung capacity featured in *COPD*), and the lack of direct linkage among medical conditions, disease outcomes and smoking (e.g. tracheotomy stoma in *Candle* and fatty deposits in *Artery*). For example, one participant said: ‘I do not understand why people blew up balloons. Was the ad trying to describe their lungs were swollen

like a balloon or what?’ (*COPD*) These comprehension issues clearly impeded some smokers’ understanding of the main messages of ads and diminished their perceptions of ad effectiveness. Although the use of a blackened sponge as human lungs (e.g. visceral metaphor used in *Sponge*) did not present comprehension difficulty among smokers, a few smokers suggested that the use of real diseased lungs would arouse greater fear and shock, thereby making the ad more convincing than the use of a sponge.

#### Emotional arousal

Smokers reported that negative feelings were aroused by the voice of suffering or graphic images of diseased body parts depicted in ads, with the most common negative emotion being fright, shock and disgust. For example, one representative response to the *Oral cancer* ad was: ‘Among all the ads, that woman’s diseased mouth made me feel most uncomfortable and threatened, and made me most feel like quitting smoking’. A majority of smokers reported that the ads featuring gruesome images of diseased body parts, such as cancerous mouth and hole in a neck (tracheotomy stoma), were very frightening and shocking. Fat squeezed from artery and tar wrung out of a blackened, lung-shaped sponge also made them feel disgusted. On the other hand, for those ads considered less effective and motivating (e.g. *Smile*, *1200 dead*, *duo* and *COPD*), most smokers described having no or weaker emotional responses. A representative participant quote about the *Smile* ad was: ‘I felt nothing about the ad. I would forget about it right away. It is not effective at all’.

#### Relevance

Testimonials like *Oral cancer* and *Candle* that portrayed smoking harms graphically and in emotional, personally relevant ways were perceived as very effective. Most smokers reported those ads such as *Smile* and *1200 dead* that they found irrelevant to them were also ineffective in motivating them to quit smoking. Strong, visceral imagery of smoking harms was also considered relevant to smokers since they could picture the damage to their bodies. Furthermore, the focus group discussions revealed that the age, smoking frequency and intensity (i.e. daily vs. nondaily and average consumption) and lifestyle or profession of characters featured in ads have more influence on smokers’ perceived relevance of the ad than other characteristics such as race, nationality and gender. Age appears to be the key sociodemographic characteristics of people featuring in ads that smoker more often relate to or not. A participant’s description

**Table 3:** Ad ratings on perceived effectiveness scale and other individual measures

Ad ratings and exposure	Oral cancer Percent/Mean (sd)	Artery	Candle	Sponge	COPD	Duo	1200 dead	Smile	$\eta^2$
Prior exposure	0.0%	3.7%	0.0%	68.5%	44.4%	35.2%	0.0%	1.9%	
Perceived Effectiveness Scale (PE)	4.0 <sup>a</sup> (0.7)	3.7 <sup>ab</sup> (0.7)	3.7 <sup>ab</sup> (0.7)	3.7 <sup>ab</sup> (0.6)	3.4 <sup>bc</sup> (0.8)	3.4 <sup>c</sup> (0.7)	3.1 <sup>cd</sup> (0.9)	2.9 <sup>d</sup> (0.8)	0.567
Easy to understand	4.5 <sup>ab</sup> (0.7)	4.2 <sup>abc</sup> (0.7)	4.1 <sup>bc</sup> (0.9)	4.5 <sup>a</sup> (0.5)	4.1 <sup>bc</sup> (0.9)	4.3 <sup>abc</sup> (0.7)	3.9 <sup>c</sup> (1.0)	4.0 <sup>c</sup> (0.9)	0.493
Teaches me something new	3.7 <sup>ab</sup> (0.9)	3.9 <sup>a</sup> (0.9)	3.1 <sup>cd</sup> (1.0)	3.7 <sup>ab</sup> (0.8)	3.8 <sup>ab</sup> (1.1)	3.4 <sup>bc</sup> (0.9)	3.4 <sup>bc</sup> (1.2)	2.6 <sup>d</sup> (1.0)	0.418
Makes me feel uncomfortable	4.4 <sup>a</sup> (0.8)	3.6 <sup>bc</sup> (0.9)	4.0 <sup>ab</sup> (0.8)	3.2 <sup>c</sup> (1.1)	2.4 <sup>d</sup> (1.1)	2.5 <sup>d</sup> (1.0)	2.4 <sup>d</sup> (0.9)	2.3 <sup>d</sup> (0.9)	0.647
Believable	4.1 <sup>a</sup> (0.9)	3.7 <sup>abc</sup> (0.8)	3.9 <sup>ab</sup> (0.9)	3.8 <sup>ab</sup> (1.0)	4.0 <sup>ab</sup> (0.8)	4.0 <sup>ab</sup> (0.9)	3.5 <sup>bc</sup> (1.0)	3.2 <sup>c</sup> (1.0)	0.353
Speaks to people like me	4.1 <sup>a</sup> (0.8)	3.8 <sup>ab</sup> (0.9)	3.9 <sup>ab</sup> (0.9)	3.9 <sup>ab</sup> (0.9)	3.8 <sup>ab</sup> (0.9)	3.7 <sup>ab</sup> (1.0)	3.3 <sup>c</sup> (1.1)	3.6 <sup>bc</sup> (1.1)	0.468

\*Note: 1. Cronbach alpha ranges from 0.79 to 0.87 among the eight ads. 2. Superscript letters denote significant difference at  $p < 0.05$  for post-hoc multiple comparison tests with Bonferroni adjustment. Ads with the same superscript letter are not significantly different from another.

of the relevance of one ad was: ‘The character’s age is similar to my age. I would wonder whether my teeth will look like her teeth if I continue to smoke... I think the age of the character matters more than the gender when I relate to the ad’. (*Oral cancer*) Many smokers spontaneously mentioned the lack of relevance in ads by comparing their relatively younger age to the age of characters in ads. ‘I had no feelings about this ad and don’t feel it is relevant to me because the characters are older than me and have longer history of smoking than me’. (*Duo*) It is worth noting that despite the low smoking prevalence among Taiwanese women, none of these male participants reported that ads that featured a female character (i.e. *Oral cancer* and *Candle*) were irrelevant to them because of the gender represented in the ad. In addition, the following response reflected irrelevance felt by smokers due to lifestyle or profession of characters featured in ads: ‘They are entertainers, often working against their biological clock. They mentioned that they drank, smoked and chewed betel nut altogether. I think their illnesses were a result of a combination of these factors’. (*Duo*)

As expected, smokers considered the anti-tobacco industry ad (*1200 dead*) less relevant to them and less effective than ads with graphic and testimonial ads because they perceived tobacco industry denormalization to be irrelevant to them. A majority of smokers thought that *1200 dead* had little to do with their smoking behaviors and was targeted toward the tobacco industry. One participant stated: ‘This ad is asking

tobacco companies to stop producing and selling cigarettes from killing people’.

Smokers evaluated the ad through their perceptions of the severity of the harms depicted in the ads. In addition, some smokers thought externally visible damage (e.g. cancerous mouth or tracheotomy stoma) made them feel particularly concerned about smoking harms to their health. Others thought internal organ damage (e.g. diseased lung or artery) were more damaging to their health, and because they are harder to detect than external health effects, they felt more frightened about these consequences.

## DISCUSSION

This study found consistent results across individual ad ratings, focus group discussions, and ad recall assessments, suggesting that ads with graphic imagery, with or without emotionally evocative personal testimonials, appear most likely to motivate Taiwanese smokers to quit smoking. Personal testimonials with graphic imagery appear to produce synergistic effects that evoke strong negative emotional arousal and personal relevance, which prior studies have found to increase perceptions of the severity of and susceptibility to smoking-related diseases, as well as to promote quitting behavior (Dunlop *et al.*, 2008; Durkin *et al.*, 2009). Research on pictorial warning labels has also found that the combination of graphic imagery with imagery of human suffering produces a stronger effect than either graphic or personal suffering by itself (Hammond *et al.*, 2012). This may be

because personal testimonials with graphic imagery not only underscore the severity of smoking-related health effects but also make them personal relevant. This is consistent with expectations from the ELM, wherein perceived message relevance is a key determinant of motivation to process health information and, ultimately, behavioral change (Petty and Cacioppo, 1986). Indeed, our study adds to the substantial evidence that supports enhancing message relevance in order to promote health behavior change (Kreuter and Wray, 2003; Rimer and Kreuter, 2006). Prior formative research found that male smokers had more variable responses to a testimonial that portrayed a mother (Wakefield *et al.*, 2011); however, our qualitative findings showed that male smokers had positive reactions to female characters featured in testimonials, perhaps because they were not portrayed as mothers or occupying a social role that is incongruent with being male, thereby minimizing issues with relevance. In addition, the testimonial ad, *Oral cancer*, provided clear and concise scientific information about disease outcomes and smoking (i.e. ‘Smoking causes 92% of oral cancer’.), which appears to have overcome comprehension issues that might have otherwise offset its effectiveness. Although visceral graphic ads that do not use actors may be most readily adapted from other countries (Wakefield *et al.*, 2011; Thrasher *et al.*, 2013), locally produced testimonials may optimize relevance and persuasion when adequate resources are available to produce tobacco control messages.

Our results suggest that the ability of ads to evoke strong emotional responses may be more important than congruence of demographic characteristics of the people featured in ads and the smokers who were exposed to the ads. Other research on highly emotional graphic imagery and testimonials to promote cessation finds that they are effective across different sociodemographic groups (National Cancer Institute, 2008; Durkin *et al.*, 2009, 2012), suggesting that emotional content may matter more than congruence between messenger and message receiver. Furthermore, our qualitative findings revealed that the age of people featured in ads may influence smokers’ perceived relevance of the ads more than other characteristics, such as sex, race or nationality. In particular, younger smokers appeared less likely to view themselves as susceptible to smoking-attributed diseases that were illustrated by people who were visibly older than them. Indeed, testimonials featuring younger smoking victims have proven effective among young viewers perhaps because of their comparable ages (Schar *et al.*, 2006). In addition, our qualitative results suggest that ads should portray ordinary smoking victims to avoid counterarguments against cessation messages that are

based in the unique social role (e.g. mothers), atypical lifestyle (e.g. entertainers) or other risky health behaviors (e.g. drinking and betel nut chewing) portrayed in an ad.

Comprehension difficulties significantly weaken the effectiveness of ads since the premise of effective ads in advertising theory is that an ad must first be understood (Agostinelli and Grube, 2003). Our qualitative findings confirmed that participants had some difficulties understanding complex terminology and questioned the lack of direct, explicit linkage between smoking and harms and the use of some metaphors to illustrate harms. Linking media campaign content with that contained in health warning labels may help enhance message comprehension, perhaps by providing supporting information and animating the otherwise static warning label content (Brennan *et al.*, 2011; Thrasher *et al.*, 2013).

The novel approach of targeting the tobacco industry was viewed as unique, but most participants felt it was irrelevant to them. The ad on the predatory practices of the tobacco industry was perceived as a protest against the tobacco industry rather than speaking to smokers and motivating them to quit. The adaptation of this tobacco industry denormalization messaging strategy for use outside of countries where this strategy has been effective should be done cautiously. The salience of the tobacco industry and public perceptions of its difference from other industries vary across societies, and this variation is likely to influence the effectiveness of these ads (Thrasher and Bentley, 2006). Nevertheless, there may be other ads in this genre which would have worked better than the one that we selected, and this ad type may become more effective over time or in a different social context.

This study has several limitations. First, the sample size is small and participants were self-selected into the study. The lack of power to detect statistically significant differences was further magnified by multiple tests. To help offset these limitations, the qualitative results complement and are consistent with the quantitative results, while uncovering and elaborating on the underlying meaning of concepts we measured in the quantitative part of the study. Furthermore, participants self-selected into the study, which may have introduced some bias. Their propensity for participating in the study may be correlated with the research topic, causing a self-selection bias that overestimates study effects.

Second, when comparing one particular characteristics of interest, the other ad characteristics and demographic characteristics of people featured in the ad were not matched and held constant. The characteristics that did not hold constant for comparisons may confound and provide alternative explanations for the relative



effectiveness of the ads. For example, demographic characteristics of people may matter more when all other ad characteristics are held constant. Future research should select or create ads that more effectively control for and manipulate these characteristics of interest to more rigorously examine the relative effectiveness of the ads.

Third, the adaption of the five foreign ads was not entirely consistent in terms of dubbing efforts, which may have impacted comprehension of ads and confounded results. *Artery* and *Sponge* were dubbed into the local language while *Candle* and *Oral cancer*, were not dubbed. The decision to not dub the two testimonial ads was to present victims' original voice and emotions, which could have been made inauthentic through dubbing. Indeed, most smokers commented that they preferred the original versions of the two ads because dubbing would have weakened their emotional impact and, in turn, their effectiveness; however, maintaining the English-language audio may have impaired some smokers' understanding of the ads even though Chinese subtitles were provided in the ads.

Fourth, the study results may have been confounded by novelty effects since some participants had seen the ads in Taiwanese campaigns and some of the foreign ads we tested, whereas other ads were novel. The less novel nature of some ads may help explain their lower reported impact than the other ads which they have not previously seen. However, the ad that most recalled having seen (i.e. *Sponge*) was also amongst the most well-evaluated ads. Furthermore, the production value for selected ads was somewhat uneven and this or other ad characteristics for which we did not account may explain the difference in participant perceived effectiveness among ads. Nevertheless, our selection of foreign ads was based on ad performance in previous studies or in their countries of origin, so our results are consistent with the notion that these ads would work best in Taiwan, as well.

In conclusion, the study findings provide preliminary evidence that testimonial ads that graphically and emotionally portray victims' smoking-attributed diseases and visceral graphic ads may have the greater potential to motivate Taiwanese smokers to think about quitting smoking because of the strong, negative emotions they provoke or because smokers perceive them as relevant. This study suggests which messaging characteristics should be adapted to country-specific characteristics and which general features of ads appear to work across both HICs and LMICs with a range of cultural contexts. Further experimental and population-based research should evaluate the relative effectiveness of differing messaging strategies in larger, more diverse demographic and

socioeconomic groups. Such research will help determine the key characteristics of the most effective tobacco control messages across diverse contexts and populations, especially populations burdened with greater health disparities.

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