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Evaluation of Mass Media Campaigns to Change Smokers' Knowledge, Attitudes, and Behaviors In China and Taiwan

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EVALUATION OF MASS MEDIA CAMPAIGNS TO CHANGE SMOKERS' KNOWLEDGE,
ATTITUDES, AND BEHAVIORS IN CHINA AND TAIWAN

by

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DEDICATION

This dissertation is dedicated to my parents for their constant love, support, and inspiration. I also dedicate this dissertation to my understanding husband, Chin-Shou, who has supported me all along, and to our children, Audrey and Austin, who are the joys of our lives. Their unconditional love and support have sustained me throughout my pursuit of academic excellence and, indeed, my life.

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ABSTRACT

Research in high income countries (HICs) suggest that anti-smoking television advertisements are most effective if they contain emotionally evocative graphic messages or personal testimonials that depict serious consequences from smoking. The ability to effectively translate these messaging strategies to low- and middle-income (LMICs) countries outside of Western cultures remains understudied. It is critical to determine which smoking cessation messages work best in LMICs because they increasingly bear the global burden of tobacco-related disease. To date there is limited evidence on the efficacy of tobacco control mass media campaigns and the relative effectiveness of different tobacco control messaging strategies in China and Taiwan. This dissertation includes two studies that aim to provide such evidence.

Study One evaluated the impact of a mass media campaign on Chinese smokers' knowledge of smoking harms and attitudes toward cigarettes as gifts. This study involved a quasi-experimental design using a population-based, longitudinal cohort of adult smokers (n=3079) to evaluate one of China's first-ever anti-smoking mass media campaigns, the "Giving Cigarette is Giving Harm" campaign (GCGH), which graphically portrayed tobacco-attributed diseases and attempted to change social norms around the time-honored cigarette gifting practice. The results suggest the GCGH campaign helped denormalize the socially engrained cigarette gifting behavior among Chinese urban smokers despite the relatively low recall and short campaign duration.

Study Two explored how Taiwanese male smokers understood and responded to anti-smoking television advertisements with different message content and executional styles. This study used a mixed methods approach involving qualitative and quantitative data collection with focus group methodology to evaluate a set of anti-smoking television advertisements with differing messaging strategies among a purposive sample of Taiwanese male smokers (n=54). The results suggest that anti-smoking television advertisements using personal testimonials that graphically and emotionally portray victims' smoking-attributed diseases may have the greatest potential to motivate Taiwanese smokers to think about quitting smoking.

In conclusion, the study findings strengthen the evidence that mass media campaigns with graphic, emotionally evocative messages that are conveyed in culturally or personally relevant ways can raise awareness of smoking harms, change smokers' attitudes that are favorable to smoking-related norms, and potentially motivate smokers to quit smoking in Asian LMICs.

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LIST OF ABBREVIATIONS

ALF	American Legacy Foundation
BAT	British American Tobacco
BHP	Taiwan Bureau of Health Promotion
CDC	US Centers for Disease Control and Prevention
China CDC	Chinese Centers for Disease Control and Prevention
COPD	Chronic obstructive pulmonary disease
CTCP	California Tobacco Control Program
FCTC	Framework Convention on Tobacco Control
GATS	Global Adult Tobacco Survey
HPB	Singapore Health Promotion Board
IRB	Institutional Review Board
ITC China Project	International Tobacco Control Policy Evaluation Project in China
ITC China Survey	International Tobacco Control China Survey in China
JTF	John Tung Foundation
PM	Philip Morris
SES	Socioeconomic status
SFB	Smoke-free Beijing
SFO	Smoke-free Olympics
THP Act	Tobacco Hazard Prevention Act
WHO	World Health Organization
WLF	World Lung Foundation

CHAPTER 1

INTRODUCTION

Tobacco use is the most significant preventable cause of death and disability, killing half of its consumers (World Health Organization [WHO], 2008, 2011). Nearly 6 million people worldwide die of tobacco-caused diseases each year, and most tobacco users are unaware of the serious health consequences caused by tobacco use (WHO, 2011). The tobacco epidemic has shifted from high- to low- and middle-income countries (LMICs), and it is anticipated that this disparity will widen further in the 21st century (WHO, 2011). If the current tobacco epidemic continues, by 2030 more than 8 million people worldwide each year will die of tobacco use, with 80% of tobacco-attributable mortality occurring in LMICs (WHO, 2011).

The World Health Organization's Framework Convention on Tobacco Control (WHO-FCTC), the first international treaty to address a public health issue, aims to promote a coordinated international response to fight the global epidemic of tobacco use (WHO, 2005). Ratifying countries are legally obligated to implement WHO FCTC recommended policies to reduce both the demand for and the supply of tobacco (WHO, 2005). These policies and practices include 1) tobacco price and taxation policies to reduce the demand for tobacco, 2) smoke-free policies to reduce harmful exposure to tobacco smoke, 3) regulation of the contents of tobacco products, 4) regulation of tobacco product disclosures, 5) regulation of the packaging and labeling of tobacco products, 6) education, communication, and training on public awareness of tobacco control issues,

7) regulation of tobacco advertising, promotion and sponsorship, 8) programs and services for tobacco dependence and cessation, 9) regulation of illicit trade in tobacco products, and 10) regulation of sales to and by minors (WHO, 2011). As of December 2012, 176 Parties has ratified the WHO FCTC (WHO, 2012).

Under the guidelines of Article 12 of the WHO FCTC, parties are obligated to use media campaigns to promote and strengthen public awareness of the hazards of tobacco consumption, tobacco production, and exposure to tobacco smoke (WHO, 2005, 2011). Research on media interventions for tobacco control in high-income Western countries suggest that anti-smoking advertisements that emphasize serious health consequences caused by tobacco use through graphic imagery and that evokes strong negative emotions are more effective than other messaging styles, such as humorous or emotionally neutral messages (National Cancer Institute, 2008; Durkin, Brennan, & Wakefield, 2012; Dunlop, Perez, & Cotter, 2012). However, the effective translation of these strategies to LMICs outside of Western cultures remains understudied and needs to be carefully examined within their sociocultural and political-economic contexts.

China is the world's largest producer and consumer of tobacco products; 52.9% men and 2.4% of women smoke, and among 301 million smokers, over one million are killed by tobacco every year (Chinese Centers for Disease Control and Prevention [China CDC], 2010). The Chinese government has not made tobacco control a high priority in its health reform plan and has allocated only 0.5% of its disease control and prevention budget to tobacco control efforts, since it ratified the WHO FCTC in 2005 (Gonhuan, 2010). Very few large-scale anti-smoking mass media campaigns were implemented in China before 2008. In 2008 the Chinese government began to launch sub-national anti-

smoking mass media campaigns, i.e., “Smoke-free Beijing” (SFB) and “Smoke-free Olympics” (SFO), to discourage smoking, particularly in smoke-free places, in order to fulfill its obligation of ensuring a smoke-free Beijing Olympics and to abide by the WHO FCTC policies. Advertisements made for the SFO campaign usually involved positive, celebratory tones, used humorous appeals, and conveyed limited information about smoking harms, while a few advertisements adopted by the SFB campaign featured graphic depiction of smoking harms. However, the little published evidence of the efficacy of these campaigns (cites) is hampered by design issues, such as non-representative samples, lack of control groups, or a repeated cross-sectional design without an attempt to assess how key mediators differed as a function of campaign exposure.

Taiwan ratified the WHO FCTC in 2005, revised its Tobacco Hazards Prevention Act based on the WHO FCTC guidelines in 2007, and had the new law go into effect in 2009 (Taiwan’s Department of Health, 2012). Unlike China, Taiwan has implemented many tobacco control policies and conducted many national-level mass media campaigns to reduce tobacco use for over two decades. Smoking prevalence among Taiwanese adult males has significantly decreased from 59.4% in 1990 to 33.5% in 2011; nevertheless, this prevalence is still 1.6 times higher than in many high-income Western countries (Taiwan’s Department of Health, 2012). Tobacco control mass media campaigns in Taiwan have generally lacked the emotionally evocative, graphic message strategies that appear most effective in other countries (National Cancer Institute, 2008). The relative performance of anti-smoking television advertisements that differ in content and style remains unclear in Taiwan due to the lack of formative and evaluation research with

appropriate study designs, examination of the full range of variability in content and style, and comparison of the effectiveness of these different approaches.

Tobacco control in China lags behind the significant advances in Taiwan. Because Taiwan shares socio-cultural characteristics with China, tobacco control research in one country can inform the development of strategies that are likely to be effective in the other country. This dissertation aims to contribute to this interchange by determining which anti-smoking mass media campaign strategies work best among Chinese and Taiwanese smokers. Two studies are presented in this dissertation. The first study used a quasi-experimental design with a population-based, longitudinal cohort of adult smokers to evaluate one of China's first-ever anti-smoking mass media campaigns, the "Giving Cigarette is Giving Harm" campaign (GCGH), that graphically portrayed tobacco-attributed diseases and attempted to change social norms around the time-honored cigarette gifting practice. This study evaluated the impact of the GCGH campaign among Chinese adult smokers by examining campaign recall and its association with changes in their knowledge of smoking harms and differences in their attitudes toward giving cigarettes as gifts. The results from this study provide evidence to support future campaign development to more effectively fight the tobacco epidemic in China.

The second study used a mixed qualitative and quantitative data collection approach involving individual ratings and focus groups to evaluate a set of anti-smoking television advertisements with differing messaging strategies among a purposive sample of Taiwanese male smokers. This study assessed the comprehension, acceptability, and perceived effectiveness of these anti-smoking messages. The findings from this study provide health policy makers and program designers with the preliminary evidence they

may make evidence-based decisions about the most effective content and style for anti-smoking television advertisements in Taiwan, while adding to the growing evidence on the effectiveness of different messaging strategies to promote cessation across culturally distinct contexts

CHAPTER 2

BACKGROUND AND SIGNIFICANCE

2.1 THE CHINESE CONTEXT

As the largest smoking population and cigarette market in the world, China has about 301 million smokers, constituting one-third of the world's total smokers and accounting for the consumption of 37% of the world's cigarettes (China CDC, 2010; Shafey, Eriksen, Ross, & Mackay, 2009). According to Global Adult Tobacco Survey (GATS) China 2010 Country Report, smoking is prevalent in China, particularly among males (52.9% of men and 2.4% women smoke). Levels of knowledge about the dangers of smoking among Chinese smokers are considerably low compared to Western countries (China CDC, 2010; Yang, Hammond, Driezen, Fong, & Jiang, 2010). Over three quarters of Chinese adults were unaware of the specific health consequences of smoking (i.e., stroke, heart attack, and lung cancer), although most people agreed that smoking and secondhand smoke were harmful to health (China CDC, 2010). About 40% of adults reported that they had not noticed any anti-smoking message about the dangers of smoking or encouraging smokers to quit via media or in public places in the previous 30 days (China CDC, 2010). The major channels through which the public had seen any anti-smoking message in the previous 30 days were television (45.4%), newspapers and magazines (21.8%), billboards (20.5%), public transportation (20.3%), and public walls (18.8%) (China CDC, 2010).

Offering cigarettes to others, both when smoking in everyday settings and when given as formal gifts, is very common and serves as a means for building social relationships (Chu, Jiang, & Glantz, 2011). For example, 52% of respondents in a 2008 internet survey in China reported that they had offered cigarettes to others and 51% agreed that cigarette gifts are appropriate for families, relatives and friends during the holidays (Chu et al., 2011). A population-based study conducted between October 2007 and January 2008 shows that the incidence of received cigarettes as a gift at most recent cigarette acquisition was 3.5%, which is equivalent to the average smoker receiving cigarette gifts five times a year (Huang et al, 2012). Smoking and cigarette exchange is a ubiquitous, widely accepted social-cultural phenomenon that is deeply integrated into everyday social interaction (Malone, 2010; Chu et al., 2011 Huang et al, 2012).

2.2 GIFTING IN CHINA

In Chinese society, gift-giving has been recognized and used as an essential medium to establish and maintain interpersonal relationships (Yang, 1994). Gift giving in Chinese culture is often practiced during particular seasons (e.g. the Lunar New Year, Mid-Autumn Festival), family- and friend-oriented events (e.g., childbirth, weddings, birthdays, mutual visiting), and business-related occasions (e.g. opening of a new firm or shop) (Yan, 1996; Kipnis, 1997; Chan et al., 2003; Qian et al., 2007). The Lunar New Year is the most celebrated festival in China, and gift giving is a central practice during the festival (Qian et al., 2007; Xiao et al., 2010; Rich et al., 2013). The nature and value of the gifts range from an inexpensive bag of seasonal, homemade or packaged food to an expensive wine or premium cigarettes, depending on the giver's expectations for favors

from the recipient, social status relative to the recipient, and previous gifting interactions with the recipient (Kohrman, 2008; Xiao, 2010; Chu et al., 2011; Rich & Xiao, 2011).

Cigarettes are one of the most popular gift items (Yang, 1994; Bian, 1994), particularly during Lunar New Year celebrations (Ark Marketing Research & Consulting, 2002; Juan, 2010) Gifting cartons of cigarettes (songyan) is one customary practice, but so is politely offering cigarettes and lighting them for others who have superior social status, such as elders and bosses (jingyan), distributing one's cigarettes to others such as peers (fayan), and sharing and smoking a single cigarette with others such as close friends (diyan) (Kohrman 2008; Xiao & Kohrman, 2008; Chu, Jiang, & Glantz, 2011).

The ritual of cigarette gifting behaviors conveys renqing (feelings and social favors), mianzi (face and respect), good wishes, closeness, and generosity to build and strengthen guanxi (relationships) in a bao (reciprocity) way (Kohrman 2008; Xiao & Kohrman, 2008; Chu et al., 2011). Guanxi, renqing, mianzi, and bao are all dominant Chinese values that give meaning to gift-giving behavior and its role in maintaining harmonious social bonds and interaction (Yang, 1994; Yan, 1996; Kipnis, 1997; Yang, Chan, & Lau, 1999; Chan, Denton, & Tsang, 2003; Qian, Razzaque, & Keng, 2007; Xiao, Wang, & Ma, 2010). Guanxi refers to a direct interpersonal linkage that determines the strength or closeness of the relationship (Qian et al, 2007). In order to sustain guanxi, one is expected to reciprocate after receiving a favor from another person; guanxi can be construed as a 'continued and reciprocal exchange of favors between the two parties involved' (Qian et al, 2007). Some researchers have argued that gift giving is the most direct strategy for building and enhancing guanxi (Kipnis, 1997). The type of gifts that

one gives may vary depending on whether guanxi is hierarchical or egalitarian, or whether the purpose is to create, alter, maintain, or acknowledge guanxi (Kipnis, 1997).

Renqing has multiple meanings—human feelings, social norms and obligations, ethics, resource, and, in some contexts, a synonym for guanxi (Yan, 1996; Qian et al., 2007; Xiao et al., 2010). Chinese people build and make good use of their guanxi by way of expressing their renqing, which is often regarded as social favors exchanged among people in the form of gifts, information, services, status, and feelings (Qian et al., 2007). Mianzi refers to an individual's "face", in other words one's public image, reputation, self-esteem, or honor bestowed by others based on one's social position (Kipnis, 1997; Qian et al., 2007). Perceptions of face gain or loss when interacting with others influence an individual's self image, leading to bettering or worsening the guanxi of the two parties involved (Yang et al., 1999). As a tool for enhancing or improving guanxi, gift giving is regarded as a type of "face act" that people conduct in order to earn or bestow face with each other (Yan, 1996; Xiao et al., 2010).

Bao represents reciprocity, return, or repayment, and serves as the basis for guanxi (Yan, 1996; Chan et al., 2003). Reciprocity is often manifested through giving, receiving, and returning gifts in a reciprocal way (Yan, 1996; Chan et al., 2003). Reciprocity is practiced in a normative way that conforms to existing hierarchical status systems, in accordance with previous interactions, and in line with proper manners of returning gifts (Yan, 1996; Chan et al., 2003). Failure to conform with proper gift giving norms brings a loss of face (Chan et al., 2003; Rich & Xiao, 2011), thus adversely affecting guanxi (Rich & Xiao, 2011).

2.3 CIGARETTE GIFTING IN CHINA

The highly stratified array of cigarette brands with widely divergent cost (e.g., ranging from \$0.14 to \$33 per pack) provide both gift givers and receivers a convenient way to evaluate the monetary value of gifts (Rich & Xiao, 2011). As such, cigarette gift givers and receivers can easily tell whether they receive a more or less expensive gift than they give, which allows suitable reciprocation in the future (Rich & Xiao, 2011). Expensive, premium cigarettes are powerful status symbols that can be presented in social interactions to display affluence and status, to facilitate business deals, or to move through government bureaucracies (Chu et al., 2011; Rich & Xiao, 2011). Among friends and business partners, gifts of expensive cigarettes are used to gain face, to show respect and hospitality, and to build friendship and *guanxi* (Pan & Hu, 2008; Xin, 2008; Juan, 2010; Chu et al., 2011).

Accepting cigarettes from others is frequently mentioned as a reason for taking up smoking (Yang, Feng, & Hao, 2008), and perceiving as unfriendly the refusal of cigarette offers from others has been shown to predict future smoking among Chinese adolescents (Zhang, Wang, & Zhao, 2000; Grenard et al., 2006). Sharing cigarettes among men in rural areas is common and a major barrier to smoking cessation (Rich & Xiao, 2011; Rich et al., 2013). More than half of smokers reported that they couldn't quit smoking because of the cigarette giving practices (Xin, 2008). Forty percent of Chinese smokers reported in a 2008 internet survey conducted during Lunar New Year that they smoked at least more than twice the amount of cigarettes than usual because of the many social gatherings and banquets held during this holiday (Xin, 2008). Forty-four percent of smokers surveyed in a rural Chinese village reported that they smoked more cigarettes

during Lunar New Year (Rich et al., 2013). Similarly, current smokers in China were more likely than nonsmokers to report receipt of smoking-related gifts such as cigarettes, ashtrays and lighters in a 2006 cross-sectional survey (Ding & Hovel, 2009). The majority of these studies were based on male smokers only given the very low prevalence of smoking among women.

According to a 2010 survey conducted by China CDC in Jiangsu province, over 50% of 1200 respondents reported that they planned to give away cigarettes as gifts to family members and business partners during Lunar New Year festival (Juan, 2010). A 2010 street intercept survey of 528 Shenyang residents, conducted by Shenyang City Health Education Institute before Lunar New Year, found similar results, with about 47% reporting that they had ever given cigarettes as gifts and about 56% reporting that they planned to give cigarette gifts during the Lunar New Year, despite the fact that 79% acknowledged that cigarettes gifts represent a health hazard (Jiang, 2010). Seventy-three percent of households in a rural Chinese village reported giving cigarettes as a gift and 80% reported receiving cigarette gifts during Lunar New Year (Rich et al., 2013).

Philip Morris (PM) and British American Tobacco (BAT) are two of the biggest transnational tobacco companies in the world, and their internal documents reveal how they promoted their products as premium gifts in order to capitalize on the Chinese cigarette gifting custom, pricing them as expensive enough to compete with Chinese premium brands (Chu et al., 2011). A 1989 PM market study shows the success of this strategy, indicating that most 15-to-60-year-old Shanghai (53%) and Beijing (60%) residents had received foreign cigarettes as gifts in the previous three months (Walmsley Limited, 1989). These results illustrate the popularity of foreign cigarettes for gifts when

considering the small segment of the Chinese market that foreign brands comprised at that time (less than 5%) (Chu et al., 2011).

2.4 TOBACCO CONTROL POLICY IN CHINA

China signed the WHO FCTC in 2003, ratified it in October 2005, and adopted it in January 2006 (Hu, 2008; WHO, 2011), declaring China's intention to implement a variety of the WHO-FCTC recommended tobacco control policies and programs. However, after ratifying the WHO FCTC, the Chinese government has not made tobacco control a high priority in its health reform plan and has allocated only 0.5% of its disease control and prevention budget to tobacco control efforts (Gonhuan, 2010). Instead of the Ministry of Health, the Ministry of Industry and Information Technology was in charge of WHO FCTC implementation in China (Gonhuan, 2010). The State Tobacco Monopoly Administration (STMA) participates in the Ministry of Industry and Information Technology and controls the China National Tobacco Corporation, which is a state-owned monopoly and world's largest single manufacturer of tobacco products and most profitable tobacco company (Hu, 2008; Gonhuan, 2010; Loo, 2012).

Tobacco control in China faces great opposition because of these conflicts of interest (Gonhuan, 2010). The STMA is the authority in China that regulates health warning labels on cigarette packing and oversees China National Tobacco Corporation (Gonhuan, 2010), and therefore has conflicting interests around the regulation of tobacco production/marketing and tobacco control (Hu, 2008, Gonhuan, 2010; Li, 2012). Health warning labels on cigarette package issued by the STMA in October 2008 fall well below the FCTC requirements (Gonhuan, 2010; ITC Project & China CDC, 2012). The

economic growth implied by the success of the tobacco industry appears to outweigh public health considerations that would regulate the industry, partly due to the STMA's dual identity and huge revenues of the tobacco industry (Hu et al, 2006).

Overall, tobacco control measures in China are weak and do not align with the WHO FCTC and its guidelines; even when policies are adopted, their enforcement and compliance appears poor (see Appendix A) (Hu, 2008; WHO, 2011; ITC Project & China CDC, 2012; Campaign for Tobacco-Free Kids, 2013). China has no national comprehensive smoke-free law (Li et al., 2010). Several national laws and policies regulate smoking in specific public places with many exceptions, and enforcement is inadequate (Li et al., 2010; Campaign for Tobacco-Free Kids, 2013). Warning labels on cigarette packages use small type, include only text warnings, cover only 30% of the front surface of the pack in Chinese and 30% of the back surface in English, and have a background that is the same color as, and easily blends in with the rest of the pack (Fong et al., 2010; WHO, 2011; Campaign for Tobacco-Free Kids, 2013). The labels consist of only two very general and similar messages (i.e., "smoking is harmful to your health" and "quitting smoking reduces health risk") rather than specific and distinct messages about smoking harms. Tobacco companies are allowed to design their own labels as long as they meet the minimum requirements set by the STMA (Fong et al., 2010). Tobacco taxes are not on the political agenda (Hu et al; 2006; Hu, 2008). The current tax rate on tobacco remains low, and is about 40% of the retail price of cigarettes (Hu et al; 2006; Hu, 2008; WHO, 2011, 2013) when the recommended sufficient level is 75% of the retail price (WHO, 2008, 2013). National laws ban direct tobacco advertising through movies, radio, television, newspapers and magazines, but not through all other forms of direct

and/or indirect advertising, including at points of sale, billboards, internet, new media, sponsorship, free distribution of tobacco products, promotional discounts, and brand stretching and sharing (Yang et al., 2010; WHO, 2013).

2.5 TOBACCO CONTROL MASS MEDIA CAMPAIGNS IN CHINA

Few large-scale anti-smoking mass media campaigns were implemented in China before 2008. In 2008 the Chinese government began to launch sub-national anti-smoking mass media campaigns, i.e., “Smoke-free Beijing” (SFB) and “Smoke-free Olympics” (SFO), to discourage smoking, particularly in designated smoke-free places, in order to fulfill the obligation of ensuring a smoke-free Beijing Olympics and of abiding by WHO FCTC policies. Advertisements made for the SFO campaign usually involved positive, celebratory tones, used humorous appeals, and conveyed limited information about smoking harms. Some advertisements adopted by the SFB campaign, however, featured graphic depictions of smoking harms. However, the little published evidence that exists suggests that some of these campaigns were effective in raising the awareness of smoking-attributed diseases (Alday, 2009; Shi, Zhao, Liu, Zhao, & Lao, 2010). However, the quality of this evidence is somewhat compromised by study design issues, such as non-representative samples, the lack of control groups, or the inability to determine associations between campaign exposure and individual-level changes in campaign-targeted outcomes due to using repeat cross-sectional designs. Furthermore, formative pre-testing of anti-smoking messages in ten LMICs including China provided preliminary evidence of message types that are likely to be effective in China – namely, those that use strong graphic and visceral imagery or personal testimonials to depict serious consequences of smoking (Wakefield et al, 2011). However, this formative study did not

evaluate messaging strategies under naturalistic conditions of exposure and did not include the full breadth of message styles.

2.6 THE TAIWANESE CONTEXT

Contrary to China's relatively recent adoption of anti-smoking mass media campaigns, Taiwan has been conducting national-level anti-smoking mass media campaigns and implementing tobacco control policies (i.e., smoke-free policies, taxes, advertising bans, warning labels on cigarette packages) to reduce tobacco use for over two decades (Chen, Hsu, & Chi, 2004). Cigarette offering and gifting was a common practice in Taiwan in 1980s, when the male adult smoking prevalence reached its peak at above 60% (Taiwan Bureau of Health Promotion, 2006). With two decades of tobacco control efforts, the smoking prevalence among Taiwanese adult males over 18 years old has significantly decreased from 59.4% in 1990 to 33.5% in 2011; nevertheless, this prevalence is still 1.6 times higher than many high-income Western countries (Taiwan Bureau of Health Promotion, 2012). Taiwan is considered to share socio-cultural characteristics with China (Appendix B); hence, data from studies of Taiwanese tobacco control could suggest tobacco control strategies that are likely to be effectively adapted to the Chinese context.

The smoking prevalence among Taiwanese adults over 18 years old in 2011 is 19.1%, with dramatic differences by sex: 33.5% of men and 4.4% women smoke (Taiwan Bureau of Health Promotion, 2012). Smoking prevalence increases dramatically among young males between the ages of 18 and 29, reaching its peak in the 30-39 age group (see Figure 1) (Taiwan Bureau of Health Promotion, 2013). Similarly, the smoking prevalence among females increases with age and reaches its peak in the 30-39 age group (Taiwan

Bureau of Health Promotion, 2013). The dramatic increase in smoking prevalences starting at age 18 to 39 highlights the pressing need to focus on this age group to prevent young adults' progression toward established smoking.

Smoking prevalence also differs dramatically among groups with different levels of educational attainment. Smoking prevalence among adults with a middle (or secondary) school education is highest while it is lowest among those with a college education or above (Taiwan Bureau of Health Promotion, 2013). Of every two adult males with a middle school education, one is a smoker (52.9% in 2010) (Taiwan Bureau of Health Promotion, 2013). It is worth noting that the subgroup of males aged between 18 and 39 with a middle school education¹ has the highest smoking rates (about 66% in 2010) compared to other subgroups (Taiwan Bureau of Health Promotion, 2013).

The percentage of Taiwanese adult smokers who attempted to quit smoking in the previous 12 months (quit attempt rate) decreased from 43.4% in 2009 to 39.3% in 2010 (Taiwan Bureau of Health Promotion, 2013), which is lower than quit attempt rates in the United States (52.4% in 2010) and Canada (46.6% in 2010) (Reid, Hammond, Burkhalter, & Ahmed, 2012). Quit attempt rates decrease among relatively older cohorts, but they increase with education level: younger smokers have the highest quit attempt rate, while smokers with lower education have the lowest quit attempt rate (Taiwan Bureau of Health Promotion, 2013). In sum, these data underscore the need for greater tobacco control efforts to motivate Taiwanese smokers to quit and to support and sustain their

¹ Among the population aged 15-34 in Taiwan, 6.3% have a middle education, 45.3% have a college education or above, 10.6% have a technical school education, 37.1% have a high school education, 0.7% have an elementary school education or less.^{91a} 13.4% of the population in Taiwan have a middle education, 26.4% have a college education or above, 11.8% have a technical school education, 32.3% have a high school education, 15.7% have an elementary school education or less.^{91a}

cessation efforts, especially among young adult smokers and smokers with lower education.

2.7 TOBACCO CONTROL POLICY IN TAIWAN

For decades, Taiwan had a closed market dominated by a government-owned tobacco monopoly, like China. However, after opening its market to foreign tobacco companies in 1987, Taiwan gradually implemented a range of tobacco control measures that are stronger than those found in China (Chen et al., 2004; Wen, Cheng, Eriksen, Tsai, & Hsu, 2005). From the 1970s to 1996, Taiwan had a similarly high smoking prevalence as China (above 55% among adult males), after which it implemented its first national tobacco control legislation—1997 Tobacco Hazard Prevention Act; THP Act² (Taiwan Bureau of Health Promotion, 2010). Currently, Taiwan has a stronger tobacco control policy environment than China after it implemented the amended THP Act in 2009 (Appendix A). Furthermore, enforcement and compliance in Taiwan is stronger than in China, where enforcement and compliance are thought to be especially poor (Hu, 2008).

2.8 TOBACCO CONTROL MASS MEDIA CAMPAIGNS IN TAIWAN

The Taiwan Department of Health and the John Tung Foundation (JTF), Taiwan's leading anti-smoking organization, have invested a significant amount of resources in national-level anti-smoking mass media campaigns to reduce tobacco use, and they have done so for over two decades (Chen et al., 2004; Taiwan Bureau of Health Promotion, 2005). For example, 12 television advertisements and 15 print advertisements in 15 anti-

² The 1997 THP Act included partial ban on the advertising and promotion of tobacco products, mandated health warning labels on tobacco product packing, regulations of maximum tar and nicotine content allowance, regulations of setting up designated smoking areas in some public places, incentive to reward smoking cessation services and programs, and the implementation of public education programs and campaigns about tobacco hazards.⁷⁶

smoking campaigns by the JTF were broadcast and disseminated nationwide from 1990 to 1997 (Chen, 1997). An anti-smoking mass media campaign including 17 television advertisements and 70 print advertisements was broadcast and disseminated nationwide from May 2003 to March 2004 (Chang, 2004). From 1997 to 2012, 24 anti-smoking television advertisements were developed by the JTF and broadcast nationwide (JTF, 2012). However, these anti-smoking mass media campaigns generally lack the emotionally evocative, graphic messaging strategies that have proven to be most effective in other countries (Taiwan Bureau of Health Promotion, 2005). Furthermore, insufficient evaluation of campaigns has inhibited determination of their effects and possibilities for enhancing effects through the use of alternative smoking cessation campaign strategies (Taiwan Bureau of Health Promotion, 2010). As a result, it is unclear whether reductions in tobacco use are due to tobacco control policies, media campaigns, or both.

A few studies have examined the relative effectiveness of anti-smoking television advertisements that differ in message content and style on smoking-related attitudes and behaviors among Taiwanese smokers. One cross-sectional study compared the prevalence of aided recall, comprehension, and perceived persuasion for twelve anti-smoking advertisements aired nationally that featured four different anti-smoking contents and styles: secondhand smoke (i.e., smoke-free restaurants); advice and support for quitting (i.e., cessation and quitline services); long-term smoking harms with a fantasy style (i.e., animated-cartoon simulation); and industry manipulation (Chang, 2004). The results showed the advertisements with cessation services and smoke-free restaurants had the highest aided recall rates and were most easily understood (Chang, 2004). The ad whose

content about tobacco industry manipulation performed best in terms of persuasion³, especially among youth and smokers; nevertheless, it had the lowest aided recall rates, perhaps due to comprehension difficulties (Chang, 2004). This study did not evaluate the impact of these anti-smoking advertisements on respondents' smoking-related attitudes or behaviors.

Another cross-sectional, mixed-method study assessed aided recall of the two smoking cessation television advertisements (one testimonial style and one animated fantasy style), the sociodemographic correlates of recall, and the correlates of agreement that general anti-smoking advertisements had positive impacts on their own and/or others' smoking behavior (Hsu & Wang, 2007). This cross-sectional survey did not compare respondents' perceived effectiveness between the two advertisements. The key finding was that respondents who *disagreed* that general anti-smoking advertisements were effective in motivating smokers to quit or persuading smokers not to smoke were more likely to be males, aged 18-39, have educational achievement above high school, and be current smokers (Hsu & Wang, 2007). Focus group discussions revealed that the testimonial ad performed better than the animated fantasy ad in prompting nonsmokers to persuade smokers not to smoke and in prompting smokers to avoid smoking in the presence of nonsmokers; nevertheless, neither of the two advertisements were thought to be likely to prompt smokers to quit smoking (Hsu & Wang, 2007). Neither of these studies clearly defined the characteristics of the anti-smoking advertisements in terms of content and style, nor did they evaluate smoker participants' perceived effectiveness of

³ Persuasion was assessed by three items: "Do you like the ad?", "Do you think this ad is persuasive?", and "Do you think this ad is creative?"

specific anti-smoking advertisements, including their relationship to smoking-related behaviors and intention to quit.

2.9 MESSAGE CONTENT AND STYLE

Marketing literature conceptualizes the characteristics of advertisements in terms of the message strategy and the execution strategy (Kotler, Roberto, & Lee, 2002), or content (informational dimension and emotional dimension) and style (Table 2.1) (Agostinelli & Grube, 2003). With regard to their informational content, anti-smoking advertisements can be classified into five basic kinds: tobacco industry manipulation (i.e. deceptive, predatory marketing that kills consumers), secondhand smoke dangers, advice and support for quitting, long-term smoking harms, and short-term health and cosmetic effects (Goldman & Glantz, 1998; National Cancer Institute, 2008). With regard to emotional content, anti-smoking advertisements can be characterized by the level of emotional arousal (high vs. low) and valence of emotion arousal (positive tone vs. negative tone) (National Cancer Institute, 2008). Furthermore, in terms of style, anti-smoking advertisements can be categorized into testimonial, scientific evidence, graphic image, fantasy, and lifestyle.

The content of the GCGH campaign in China does not clearly fit into any of the five informational types that characterize anti-smoking advertisements from Western countries. Its informational content addresses the long-term harms of smoking while linking these harms to the cultural practice of giving cigarettes as gifts. Its style combines lifestyle and graphic image approaches, using staged scenes with actors engaged in familiar, socially patterned cigarette gifting contexts and graphically portraying smoking-related diseases. The GCGH campaign's unique message strategies warrant an

investigation into whether this campaign strategy is effective, particularly given the lack of previous campaigns that have used graphic imagery in China.

Taiwan's anti-smoking mass media campaigns generally lack the emotionally evocative, graphic messaging strategies. The relative performance of anti-smoking television advertisements that differ in content and style are unclear in Taiwan due to the lack of formative and evaluation research with appropriate study designs, examination of the full range of variability in content and style, and comparison of the effectiveness of these different approaches. This warrants a qualitative inquiry to understand Taiwanese smokers' responses to the range of smoking cessation message contents and execution styles.

2.10 MASS MEDIA CHANNELS

Anti-smoking campaign messages have been conveyed through many different mass media channels (National Cancer Institute, 2008). The structural characteristics of mass media channels can affect behavioral outcomes targeted by public health campaigns, as they primarily differ along two dimensions⁴: (1) reach and specificity; and (2) arousal and involvement (Flora et al., 1997). Television is a high-reach, arousing media channel extensively used to disseminate campaign messages (Flora, Saphir, Schooler, & Rimal, 1997; Nelson et al., 2008; National Cancer Institute, 2008; Durkin et al., 2012).

Newspapers, magazines, and radio have lower reach but greater specificity, which allows for more targeted messaging of particular audiences that have specific sociodemographic characteristics or even health status (Flora et al., 1997). Furthermore, engagement with

⁴ The reach and specificity dimension refers to the breadth (that is, the size and particular type of audience) of the population exposed to the channel. The arousal and involvement dimension refers to a media channel's ability to stimulate emotional responses and motivate people to think carefully about a message.

printed media is often a more involved experience, prompting the audience to think more deeply about a message than television, which is often a background activity (Flora et al., 1997). However, few studies have examined the relative effectiveness of different media channels of delivery of tobacco control mass media campaigns (Durkin et al., 2012). Overall, television has been suggested to be the most effective, powerful medium for reaching target general populations and smokers (Flora et al., 1997; Jepson et al., 2006; Nelson et al., 2008; National Cancer Institute, 2008; Durkin et al., 2012). Media campaigns delivered through Internet websites and other emerging social media can prevent youth smoking initiation as well as increase quit attempts among youth and adults (Jepson et al., 2006; Buller et al., 2008; National Cancer Institute, 2008; WHO, 2011). Online ads (i.e., Internet websites and mobile devices) that run continuously throughout a national TV campaign can prompt smokers to engage in cessation information-seeking behaviors, such as calling quitlines or visiting cessation websites (CDC, 2013).

2.11 CONCEPTUAL FRAMEWORK OF THE ANTI-SMOKING MEDIA MESSAGE EFFECTS

Marketing and communication literature has shown that message content and style influences attention, affective responses and recall to anti-smoking messages (Agostinelli & Grube, 2003; National Cancer Institute, 2008). The premise of effective advertisements in advertising theory is that an ad must first be attended to, then understood and recalled in order to influence beliefs and behaviors thereafter (Agostinelli & Grube, 2003). The affective processing of message content and style influences individuals' cognitions, including acceptance of messages, i.e., intention to adopt a

message's recommendations (Witte, 1994), which in turn influence behavioral intentions that mediate campaign effects on smoking cessation behaviors (Agostinelli & Grube, 2003).

An individual's sociodemographic and other characteristics (i.e., age, race, gender, education, smoking and quitting behaviors) are associated with his or her media usage, which in turn impacts exposure to anti-smoking advertisements (Agostinelli & Grube, 2003). These sociodemographic and smoking-related characteristics can also influence attention towards, affective responses to and recall of anti-smoking messages (Agostinelli & Grube, 2003; National Cancer Institute, 2008). For example, smokers who have a greater intention to quit and who recently have attempted to quit respond more favorably to anti-smoking messages (Davis et al., 2011). An individual's receptivity to tobacco advertising also negatively influences anti-smoking message processing (Agostinelli & Grube, 2003). Similarly, exposure to other anti-smoking messages could augment the effects of particular anti-smoking campaigns. For example, evidence suggested that prior exposure to pictorial health warning labels on cigarette packages was associated with more favorable responses to linked anti-smoking media campaigns and vice versa (White, Webster, & Wakefield, 2008; Brenna, Durkin, Cotter, Harper, & Wakefield, 2011; Thrasher et al, 2013). Responses to media campaigns may also be moderated by perceived social norms (i.e., social acceptability of smoking, family/peer influence) (Putte, Yzer, & Brunsting, 2005; Dohnke, Weiss-Gerlach, & Spies, 2010). Perceived social norms not only influence intention to quit smoking (Farrelly et al., 2005, 2009) but they also promote downstream smoking cessation (Biener, Hamilton, Siegel, & Sullivan, 2010). Media campaigns can decrease the social acceptability of smoking (i.e.,

campaigns in support of smoke-free environments) and thereby either directly or indirectly promote smoking cessation (Yanovsky, & Stryker, 2001; Scollo, & Winstanley, 2008).

In combination with the factors identified above, cognitive and psychosocial models of health behavior, including the theory of planned behavior (Ajzen, 1991), social cognitive theory (Bandura, 1986), the health belief model (Becker, 1974), Elaboration Likelihood Model (ELM) (Petty and Cacioppo, 1986), and protection motivation theory (Rogers & Prentice-Dunn), can be used to construct a conceptual framework of the mediators and moderators of media campaign effects. Campaigns can influence these psychosocial variables, such as knowledge of smoking harms, attitudes toward smoking harms, perceived risk and severity of smoking harms, and perceived smoking norms. Changes in these psychosocial mediators may predict both intention to quit and quit behavior (Fong, Cummings, Borland, Hastings, Hyland, & Hammond, 2006). However, since the GCGH was not a cessation campaign and the primary campaign message was to change attitudes about cigarette gifts, quitting-related behaviors are more distal to campaign exposure than the mediating variables such attitudes and knowledge. Therefore, weakly association between campaign exposure and quitting-related behaviors was expected to be weak and is not included in the conceptual model for Study One (see Chapter 3, Section 3.2). In order to examine Taiwanese smokers' perceived effectiveness of anti-smoking television advertisements with the different content and style in relation to their quitting-related behaviors, quit attempt is included in the conceptual model for Study Two (see Chapter 3, Section 3.9).

2.12 MASS MEDIA CAMPAIGNS AND GLOBAL TOBACCO CONTROL

Under the guidelines of Article 12 of the WHO FCTC, parties are required to use media interventions to promote and strengthen public awareness of the hazards of tobacco consumption and production as well as the dangers of exposure to tobacco smoke (WHO, 2005, 2011). The WHO FCTC recommends implementing national anti-smoking mass media campaigns to educate the public about the dangers of tobacco use (WHO, 2011). Mass media campaigns significantly reduce smoking initiation among youth, increase smoking cessation among adults (Goldman & Glantz, 1998; Siegel, 2002; Farrelly, Davis, Haviland, Messeri, & Healton, 2005; National Cancer Institute, 2008; Wakefield et al., 2008; Durkin, Wakefield, & Spittal, 2011), decrease the social acceptability of smoking, and establish smoke-free norms (Goldman & Glantz, 1998; National Cancer Institute, 2008; Durkin et al., 2011; Thrasher et al., 2011).

Research on media interventions for tobacco control in high-income Western countries suggest that anti-smoking advertisements that emphasize serious health consequences caused by tobacco use through graphic imagery and strong negative emotions outperform other messaging styles, such as humorous or emotionally neutral messages (National Cancer Institute, 2008; Durkin et al., 2012; Dunlop et al, 2012). Highly emotional testimonial advertisements that portray people describing how their lives or loved ones' lives are affected by smoking-related diseases are also effective in affecting smokers' perceived effectiveness ratings and prompting thoughts of quitting (National Cancer Institute, 2008; Durkin, Biener, & Wakefield, 2009; Durkin et al., 2011; Davis, Nonnemaker, Farrelly, & Niederdeppe, 2011; Wakefield et al., 2011; Dunlop et al., 2012).

Evidence on the effectiveness of advertisements with messages that focus on tobacco industry manipulation of smokers is more mixed, probably due to comprehension issues, potential issues with cultural translatability, distal concept of industry manipulation, or study designs (Thrasher & Bentley, 2006; National Cancer Institute, 2008; Malone, Grundy, & Bero, 2012). Stronger evidence has been found for the effectiveness of industry manipulation messages among youth (Farrelly, 2005, 2006; Thrasher et al., 2004; Thrasher & Jackson, 2006; Thrasher, Niederdeppe, Jackson, & Farrelly, 2006) and young adults (Hammond, Fong, Zanna, Thrasher, & Borland, 2006; Ling, Neilands, & Glantz., 2007, 2009). The majority of this research has been conducted in Western high income countries (Malone et al., 2012). The effective translation of these strategies to LMICs outside of Western cultures remains understudied. It is critical to determine which messaging strategies will work best in LMICs that increasingly bear the global burden of tobacco-related disease.

Research on the translation of tobacco control media strategies to LMICs has only recently begun to emerge (Murukutla et al., 2011; Wakefield et al, 2011; Thrasher et al., 2011, 2013; Mullin et al., 2013). Evidence from a formative anti-smoking message testing study in ten LMICs suggests that advertisements with graphic emotional appeals that portray serious smoking-related harms work in the context of the LMICs; however, advertisements with complex metaphors or medical terminology or personal testimonials have produced more inconsistent results (Wakefield et al, 2011). A population-based evaluation study of an India mass media campaign that used a cancer surgeon to graphically present serious harms of local victims from the use of smokeless tobacco was an effective strategy to increase knowledge, negative attitudes and cessation-related

behaviors (Murukutla et al, 2011). Population-based studies in the LMICs (i.e., China, Russia, and India) also consistently showed that anti-smoking advertisements that portray the serious health consequences of tobacco use with graphic imagery and in testimonials are the most effective (Mullin et al., 2013). A population-based study in Mexico suggested that a mass media campaign that included graphic portrayal of children suffering serious health effects from toxic chemicals in secondhand smoke similar to pictorial health warning labels was able to achieve synergistic effects between the two strategies (Thrasher et al., 2013). These formative and impact evaluation studies suggest that anti-smoking ads that portray of the serious health consequences of tobacco use with graphic imagery and/or with testimonials are likely to work in LMICs.

In sum, there is a substantial scientific literature to support best practices for anti-smoking mass media campaigns in Western countries, including media channel, message content and executional style. However, research is needed to examine the transferability of these evidenced-based strategies to different socio-cultural contexts, like China and Taiwan. The elements described in Chapter 2 Background and Significance are integrated into the conceptual framework that orients this study of how media, message, audience, and psychosocial factors mediate or moderate the effects of anti-smoking campaign messages on smoking-related outcome measures. As such, the conceptual framework provides the basis for study hypotheses and questions that are specifically described in Chapter 3 Methods.

Table 2.1 Characterization of anti-smoking advertisements' content and style

Characteristics	Dimension/Category	Category/Description
Content	Informational	Tobacco industry manipulation Secondhand smoke dangers Advice and support for quitting Long-term smoking harms Short-term health and cosmetic effects
	Emotional	Level (low vs. high) Tone (negative/sad or fear; positive/humorous; neutral)
Style	Testimonial	Real people describing their suffering smoking harms
	Scientific evidence	Statistics or research results
	Graphic image	Visual graphic depiction of smoking harms to the body
	Fantasy	Use of unrealistic characters/situations
	Lifestyle	Staged scenes with actors talking about smoking harms

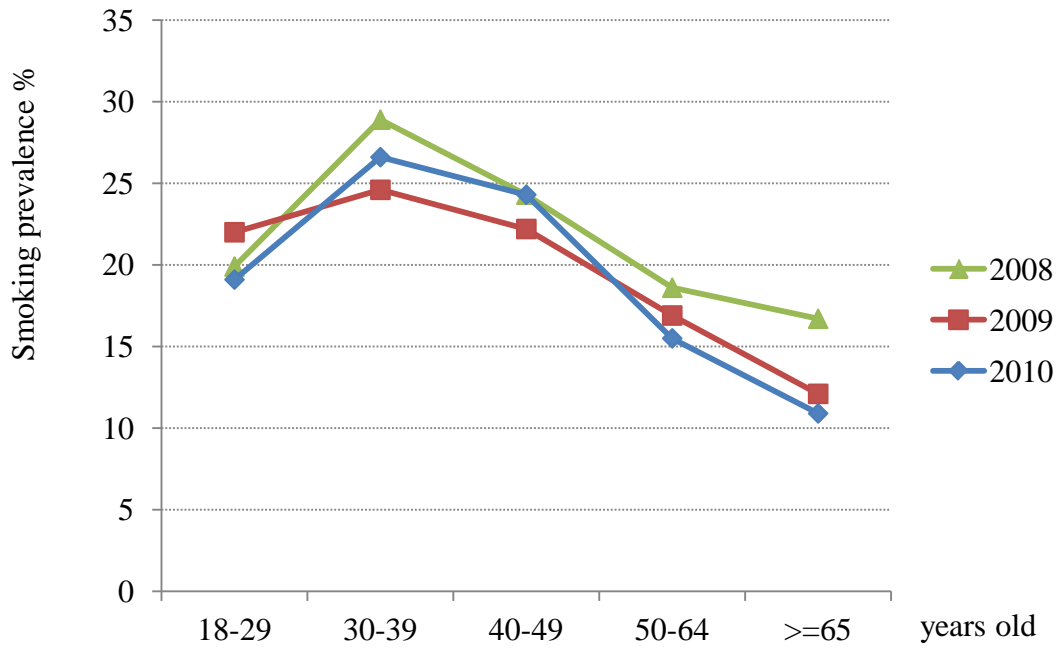


Figure 2.1 Smoking prevalences among Taiwanese male adults by age group from 2008 to 2010

Note. Data sources come from Taiwan Bureau of Health Promotion's Annual Adult Smoking Behavior Survey.

CHAPTER 3

METHODS

3.1 OVERVIEW OF RESEARCH DESIGN FOR STUDY ONE

The study used a sample drawn from waves 2 and 3 of the China administration of the International Tobacco Control Policy Evaluation Project (i.e., ITC China), a longitudinal cohort survey in China designed to be parallel to surveys in 21 other countries that participate in the ITC Project. Data were collected in six Chinese cities (i.e., Beijing, Shanghai, Guangzhou, Shenyang, Changsha and Yinchuan) (Wu et al., 2009), of which the GCGH campaign was broadcast in four cities (i.e., Beijing, Shanghai, Guangzhou, and Shenyang) from January 2009 to February 2009. This campaign period coincided with the interval between waves 2 and 3, for which data were collected between October 2007 and January 2008, and between May and September 2009, respectively.

The cities were selected based on the representativeness of geographical location and economic development, because the ITC China survey has limited resources so that it was unable to carry out face-to-face interviews on national representative samples. The entire population of the six cities represented 4.45% of the entire population in China (ITC Southeast Asia China Research Team & ITC Southeast Asia International Planning Group [ITC SEA], 2006). Shanghai, Beijing, Guangzhou and Shenyang are the largest cities respectively in the east, north, south, and northeast of China amongst the top ten

largest cities in China (Figure 3.1) (ITC SEA, 2006; Wu et al., 2009). Changsha is a mid-sized city and one of the major bases for Chinese tobacco industry in southern central China (ITC SEA, 2006; Wu et al., 2009). Yinchuan is a small, economically less developed city in northwest China (ITC SEA, 2006; Wu et al., 2009). The percentage of urban population compared to rural population is 40% (ITC SEA, 2006).

A stratified multi-stage cluster sampling design was used to produce a representative sample within each city (see below for more detail on sample selection and recruitment methods). The analytic sample for the current study included only adult smokers, who had smoked at least 100 cigarettes in their lifetime and had smoked at least once a week at the time of the Wave 2 survey. A quasi-experimental design was used to test the research hypotheses. Two types of quasi-experimental comparisons were employed: comparison of the cities where the television campaign was and was not aired, as well as comparison of the people who did and did not recall the campaign within the intervention cities.

3.2 CONCEPTUAL MODEL AND RESEARCH HYPOTHESES

Drawing on the conceptual framework of anti-smoking media message effects outlined in Chapter 2 Background and Significance, I developed a conceptual model for Study One, which is illustrated in Figure 3.2.

Study hypotheses regarding the direct and indirect effects of the GCGH campaign include:

H₁: Participants in the intervention cities at the post-campaign are more likely to disagree that cigarettes were good gifts for family or friends than participants in the control cities.

H₂: Participants in the intervention cities have higher campaign-targeted knowledge of smoking harms than participants in the control cities.

H₃: Within intervention cities, participants who recalled the campaign are more likely to disagree that cigarettes were good gifts for family or friends than those who did not recall the campaign.

H₄: Within intervention cities, participants who recalled the campaign have higher campaign-targeted knowledge of smoking harms than those who did not recall the campaign.

H₅: Within intervention cities, participants who recalled the campaign and who reported exposure through more media channels (i.e., TV, mobile media⁵, poster) are more likely to disagree that cigarettes were good gifts for family or friends than those who did not recall the campaign or who reported exposure through fewer channels.

H₆: Within intervention cities, participants who reported having seen the campaign on TV are more likely to disagree that cigarettes were good gifts for family or friends than those who reported having seen the campaign on posters and mobile media.

H₇: Within intervention cities, participants who reported exposure through more channels have higher campaign-targeted knowledge of smoking harms than those who did not recall the campaign.

H₈: Within intervention cities, participants who recalled the campaign have higher perceived risks of smoking than those who did not recall the campaign.

⁵ Mobile media refers to television screens where advertisements are placed on city buses and subway trains.

H₉: Within intervention cities, participants who recalled the campaign are more likely to perceive that Chinese society disapproves smoking than those who did not recall the campaign.

3.3 STUDY SAMPLE

The analytic sample for this study is derived from a sample of approximately 800 adult smokers in each of six Chinese cities in waves 2 and 3 of the ITC China Survey. Sampling involved a stratified multi-stage cluster sampling design to produce a representative sample within each city (Figure 3.3). The first stage of selection involved street districts and the second stage involved residential blocks, using the randomized systematic probability-proportional-to-size (PPS) sample method (Goodman & Kish, 1950; Hartley & Rao, 1962). In each city, ten street districts were randomly selected, with probability of selection proportional to the population size of the street district according to the city registration system. Within each of the 10 selected street districts, two residential blocks were then selected, again with probability of selection proportional to the population size of the residential block according to the city registration system. Within each of the 20 residential blocks, 300 households were randomly selected without replacement, and they were subsequently enumerated to collect information on age, gender, and smoking status for all adults living in the selected household. Therefore, 6000 households were selected prior to the selection of individuals within each of six cities. The use of PPS sampling at each of the first two stages (street district and residential block), and the simple random sampling of 300 households in each residential block, ensured that each eligible household in the city had approximately the same chance of being selected in the frame of 6000 households.

All originally randomly selected households were enumerated. The enumerated 300 households within each block were then randomly ordered, and adult smokers and non-smokers were also randomly ordered and selected until 40 smokers and 10 nonsmokers were surveyed for each block (at most one smoker and one nonsmoker per household). Smokers were defined as participants who had smoked at least 100 cigarettes in their lifetime and were smoking at least once a week at the time of the Wave 2 survey. The next birthday method was used to select one individual where there was more than one eligible individual in a sampling category available in a household. In order to increase the sample size of female smokers, one female smoker was surveyed along with one male smoker within each selected household whenever possible. Approximately 800 smokers and 200 non-smokers were interviewed in each city at each wave.

To maintain sample size over time, participants who were lost to follow-up were replaced using the same sampling frame constructed at Wave 1. For example, the Wave 2 replenishment survey drew its sample from the same list of the 300 randomly selected households constructed in the Wave 1 survey for each selected residential block. All 300 selected households were enumerated. Those enumerated households that were not surveyed in Wave 1 were randomly ordered, and smokers and non-smokers were approached following the randomized order and next birthday method as described above for Wave 1. A total of 4,732 smokers were surveyed at Wave 1 with response rates⁶ for smokers in the six cities ranging from 39% to 66% and cooperation rate⁷ from 80% to 95%. The average retention rates for Wave 2 and 3 were both 81% for smokers. The

⁶ Response Rate = Completed interviews/Smokers selected in the initial sample.

⁷ Cooperation Rate = Completed interviews/(Completed interviews and refusals that were successfully contacted).

analytic sample for the current study included the 3709 adult smokers who were surveyed at Wave 2 and who were successfully followed up at Wave 3.

3.4 DATA COLLECTION PROCEDURES

The enumerators and interviewers were recruited and trained by local staff for the China CDC, and they followed a strict protocol and made visits up to four times to a household for enumeration and recruitment. The surveys were conducted in Mandarin Chinese through face-to-face interviews. The average time to complete a survey was about 30 minutes for smokers and 10 minutes for non-smokers, excluding time to provide participants with information about the survey and obtain consent.

Several quality control procedures were adopted, for example, making MP3 recordings for all smoker interviews with subsequent monitoring of a random selection of recordings. All the ITC China survey materials and procedures were reviewed by the research ethics board at the University of Waterloo and by institutional review board at China CDC. More details on design including sampling procedures, survey measures and questionnaire development, data collection methods and general analytic strategies of the ITC China Survey can be obtained from Wu and his colleagues' paper (Wu et al., 2010).

3.5 “GIVING CIGARETTES IS GIVING HARM” CAMPAIGN MATERIALS

In partnership with the WHO and World Lung Foundation, China CDC launched the “Giving Cigarettes is Giving Harm” (GCGH) campaign in January 2009. The GCGH campaign materials included one 30-second television advertisement and three posters. The TV spot can be viewed at the WLF's tobacco control mass media resource at (WLF,

China CDC, & WHO, 2009). Campaign messages equated gifting cigarettes to loved ones and colleagues with giving them omens that portend future diseases and death from smoking and discouraged people from giving away cigarettes as gifts. One of the three posters used the same message depicted in television advertisement and was featured on Tobacco Control Journal's February 2010 cover (WLF, China CDC, & WHO, 2009). The other two posters used similar messages (Mullin et al., 2013).

The television advertisement was broadcast in eight major cities in China for four weeks from January through February 2009. Four cities in the ITC China Survey, Beijing, Shenyang, Shanghai, and Guangzhou, were among the eight cities where the campaign was implemented and served as intervention cities in the current study. The television advertisement aired on city- and district-level television networks, on mobile media on city buses and subway trains (i.e., television screens on public transit vehicles which broadcast paid advertisements and public service announcements), outdoor electronic billboards, and in hospitals, schools, office buildings, community centers, and shopping centers. The television advertisement also aired on a national television network in Beijing and a satellite television network in Guangzhou. During the same period, 200,000 posters were distributed sub-nationally in more than 30 provinces, including the provinces where the four intervention cities are located. Two ITC China Survey cities, Yinchuan and Changsha, served as control cities where neither television nor poster campaign was implemented.

3.6 MEASUREMENTS

Variables analyzed in the study are as illustrated in Figure 3.2, and their definition and operationalization are outlined as follows as well as in Table 3.1.

Primary dependent variables

Campaign-targeted knowledge: Knowledge of the health effects caused by smoking was assessed in the pre- and post-campaign surveys. Participants indicating whether they believed smoking causes lung cancer in smokers, stroke, and coronary heart disease (included in campaign materials), as well as other diseases that were not addressed in campaign materials (i.e., lung cancer in nonsmokers from secondhand smoke, impotence in male smokers, premature aging, and emphysema). These seven knowledge questions use binomial response formats (yes vs. no or don't know). Each knowledge question was assessed individually, and an index was created for campaign-targeted knowledge with values ranging from 0 to 3.

Campaign-targeted attitude: In the post-campaign survey only, participants were asked how much they agreed that cigarettes are good gifts for friends and family to measure perceived social acceptability of giving cigarettes as gifts. The attitudinal question used a 5-point Likert scale to assess strength of agreement or disagreement. The original responses were dichotomized to reflect endorsement of the campaign aim of promoting disapproval of this practice (strongly disagree and disagree = 1; strongly agree, agree, and neither disagree nor agree=0).

Perceived risk of smoking harms: Perceived risk of smoking was measured by two questions at the pre- and post-campaign surveys: (1) asking how worried participants felt that smoking will damage their health in the future on a 3-point scale (not at all, a little, or very much); (2) asking how often in the last month, if at all, participants thought about the harm their smoking might be doing to themselves on a 3-point scale (never,

occasionally, often). These two items were averaged to measure perceived risk of smoking (Correlation coefficient = 0.56).

Perceived smoking norm: Perceived smoking norm was measured by one question at the pre- and post-campaign surveys. This measure asked smokers about their opinion about Chinese society's attitude toward smoking on a 3-point scale (support, disapprove, or neither support nor disapprove). Responses were dichotomized to reflect disapproval versus support or neither support nor disapproval.

Primary independent variables

Campaign exposure measures: Exposure to the GCGH campaign was assessed with an aided recall question at the post-campaign survey only: "Have you ever seen the campaign "Giving Cigarettes is Giving Harm"?. Participants were asked about their past exposure to the GCGH campaign, without any other visual presentation and verbal description of the campaign content. Encoded exposure assessed by this kind of recall task has been validated in other campaign research (Southwell, Barmada, Hornik, & Maklan, 2002). For those who recalled the campaign, exposure through each of three media was queried: TV, poster, and mobile media on buses and subways.

Adjustment variables

Sociodemographics and smoking status: Sociodemographic variables were assessed in pre-campaign survey and included age, gender (female, male), monthly household income (low = 3000 yuan and under; medium = 3001-5000 yuan; high = 5001 yuan and above) and education (low = elementary school or less; medium = junior high school and high school/technical high school; high = college/university or more). Smokers were

defined as participants who had smoked at least 100 cigarettes in their lifetime and smoked at the time of the pre-campaign survey and then categorized into daily smokers and nondaily smokers by the frequency of their cigarette consumption. The heaviness of smoking index (HSI) was calculated from two ordinal measures, the amount of daily cigarette consumption ('0 to 10 cigs' coded as 0, '11 to 20 cigs' coded as 1, '21 to 30 cigs' coded as 2, 'more than 31 cigs' coded as 3) and the time to the first cigarette after awake ('more than 61 min' coded as 0, '31 to 60 min' coded as 1, '6 to 30 min' coded as 2, 'less than or equal to 5 min' coded as 3), with a range of scores from 0 to 6 (Heatherton, Kozlowski, Frecker, Rickert, & Robinson, 1989). Intention to quit smoking was measured by the question 'Are you planning to quit in the next month, six months, beyond six months, or not at all?' and was then dichotomized to indicate whether participants planned to quit within the next six months or not ('within the next month' and 'within the next six months' as coded as 1 and 'not planning to quit' and 'sometime in the future, beyond six months' coded as 0) (Fagan et al., 2007; IARC, 2008).

General anti-smoking campaign exposure measures: Exposure to general anti-smoking campaign was assessed by asking participants to indicate their level of exposure (never, once in a while, or often) to such campaigns in the six months prior to the interview in the post-campaign survey.

Smoke-free Olympics campaign exposure: Participants were asked to indicate whether they had heard of the "Smoke-free Olympics" campaign in the pre-campaign survey.

3.7 DATA ANALYSIS

The analyses were conducted using STATA, version 11.2 (StataCorp, 2012). The attrition analysis involved using unadjusted data and conducting chi-square tests and t-

tests to examine differences among participants who were followed up and those who were lost to attrition between the two waves (see Table 4.1). All other analyses accounted for the multi-stage, cluster sampling design and for sampling weights developed for the longitudinal sample (Wu et al., 2010).

Logistic regression was used to examine association between individuals' characteristics and campaign exposure (Appendix C, Table C.1). To assess the construct validity (i.e., discriminant validity) of the campaign exposure assessment, logistic regression models were estimated by regressing the GCGH campaign exposure on the variable representing any anti-smoking campaign exposure through the corresponding channels (i.e., TV and poster) in the last six months when assessed at baseline (i.e., before the GCGH campaign, see Table 4.2).

For each campaign-targeted outcome, two different analytic samples were used: 1) comparing intervention cities with control cities, and 2) within the intervention cities, comparing those who reported exposure with those who did not report exposure. Crude and adjusted estimates of the relationship between exposure and outcomes were assessed. Adjustment variables included age, sex, marital status, income, education, consumption intensity, intention to quit, and recalls of anti-smoking campaigns. Logistic regression models were estimated to examine crude and adjusted associations between campaign exposure and dichotomous dependent variables (i.e., attitude toward cigarette gifts in Table 4.3 and social disapproval of smoking in Appendix C, Table C.2). Logistic regression was also used to examine associations between campaign exposure and each individual knowledge question at post-campaign, adjusting for corresponding pre-

campaign knowledge of that outcome as well as for other adjustment variables (see Appendix C, Table C.3).

Poisson regression was used to examine association between campaign exposure and post-campaign levels of count variables, adjusting for corresponding pre-campaign levels of count variables (i.e., knowledge index of health effects in Table 4.4). Since the variance of knowledge measures is slightly smaller than the mean (e.g., $1.1 < 1.9$ for knowledge index of health effects), robust standard errors were obtained to control for minor violation of assumptions for Poisson distribution. Linear regression was used to examine association between campaign exposure and post-campaign levels of continuous variables, adjusting for corresponding pre-campaign levels (i.e., perceived risks of smoking in Appendix C, Table C.4). Two different analytic samples were used: 1) comparing intervention cities with control cities, and 2) within the intervention cities comparing those who reported exposure with those who did not report exposure. Crude and adjusted estimates of the relationship between exposure and outcomes were assessed.

For sensitivity analyses, ordinal regression and negative binomial regression were used to examine association between campaign exposure and post-campaign levels of continuous variables (i.e., ordinal or count numbers), adjusting for corresponding pre-campaign levels of knowledge index of health effects (i.e., knowledge index of health effects in Appendix C, Table C.5 and C.6). Similar results were found between Poisson regression and ordinal regression analyses, with differences in the some adjusted models where significance differences no longer maintain in ordinal regression analysis (i.e., the indicators of recalling the campaign through one channel and recalling the campaign

through TV). Exactly the same results were found between Poisson and negative binomial regression analyses.

3.8 OVERVIEW OF RESEARCH DESIGN FOR STUDY TWO

This study explored how Taiwanese male smokers understood and responded to different anti-smoking television advertisements, in order to determine which message content and executional styles are most likely to motivate them to quit smoking. Advertisements were purposively selected based on contrasting advertisement content and style including: 1) the use of testimonial or not; 2) graphic portrayal of smoking-related diseases or not; and 3) level of negative emotional arousal produced by advertisements. This purposeful selection of contrasting stimuli aimed to determine which ad characteristics appear most likely to motivate Taiwanese smokers to quit smoking.

This study used a mixed qualitative and quantitative data collection method that includes an individual ad rating survey, focus groups and a follow-up telephone survey. Before participating in the focus groups, smokers viewed and individually rated eight different anti-smoking ads, after which they participated in a semi-structured focus group discussion about the advertisements (Murphy, Wakefield, Durkin, & Cotter, 2010; Wakefield et al., 2011). One week after the focus group, a telephone call was made to each participant to assess which advertisements they recalled, which is a validated method for measuring memorability and engagement with ads (Terry-McElrath et al., 2005) (Figure 3.4).

An advertisement rating questionnaire was administered to collect individual quantitative data on smokers' responses to different advertisements, using questions to

assess message comprehension, acceptance and impact. This was followed by qualitative inquiry using focus groups because this approach provides rich and in-depth information about perceptions, feelings, beliefs, opinions, attitudes, experiences and behavior intentions of a particular group (Eern, 2001; Murphy, 2010). Focus groups have been used extensively in marketing research to get consumers to disclose their conscious and subconscious underlying reasons for product and brand preference, and, as such, is useful for obtaining impressions and feedback about products, service, programs as well as some particular topics (Eern, 2001; Uline, Robinson, & Tolley, 2005; Berg, 2007). Focus group methodology has been applied increasingly to public health research and been considered useful for formative research and evaluation of outcomes (Uline et al., 2005). Many tobacco control researchers and advertising agencies employ focus groups to evaluate or pretest anti-smoking ads or advertising concepts (Goldman & Glantz, 1998; Schar, Gutierrez, Murphy-Hoefer, & Nelson et al., 2006; National Cancer Institute, 2008; Murphy et al., 2010). Focus group evaluation can assess whether the proposed content, style, and tone of the anti-smoking ads communicate the desired message clearly and effectively to target audiences (Schar et al., 2006). Through focus group discussions, differences and similarities among smokers concerning their understanding, thoughts and feelings about anti-smoking ads and smoking behavior can be elicited and revealed in their own words, which can provide rich and valuable insights into which ads will be most effective (Murphy et al., 2010).

The benefits of using both quantitative and qualitative data are complementarity and triangulation (Berg, 2007; Hesse-Biber, 2010). Quantitative data that result from self-administered, individually reported results can reduce conformity pressures and dominant

opinion issues that often accompany focus group studies. They may also be used to confirm or disconfirm the findings of focus group discussions. In particular, the findings of focus groups can enhance and elaborate the underlying meaning of quantitative results and provide insights on key issues that the quantitative survey did not anticipate as important. The questionnaire also allows participants to think about their own attitudes, feelings and positions about discussion topics, which thereafter facilitates a richer discussion in the focus group when similarities and differences in participants' views about each ad can be further explored in more detail

3.9 CONCEPTUAL MODEL AND STUDY QUESTIONS

Drawing on the conceptual framework of anti-smoking media message effects outlined in the Chapter 2 Background and Significance, a conceptual model for Study Two is illustrated in Figure 3.5.

The overall research question for Study Two is: what kind of content and style of anti-smoking ads do Taiwanese smokers think most motivate them to quit smoking? Six sub-questions were developed to explore how Taiwanese smokers perceive the effectiveness of anti-smoking television ads that have contrasting messaging strategies (i.e., ad content and style).

RQ₁: How do Taiwanese smokers perceive the effectiveness of anti-smoking television ads that feature visceral imagery of bodily harms in motivating them to quit compared to ads that use metaphors to express bodily harms?

RQ₂: How do Taiwanese smokers perceive the effectiveness of anti-smoking television ads with testimonials that graphically portray suffering from smoking-related diseases in

motivating them to quit compared to testimonials that less graphically portray suffering from smoking-related diseases?

RQ₃: How do Taiwanese smokers perceive the effectiveness of anti-smoking television ads with testimonials that graphically portray suffering from smoking-related diseases in motivating them to quit compared to ads that feature visceral imagery of bodily harms?

RQ₄: How do Taiwanese smokers perceive the effectiveness of anti-smoking television ads that use negative emotion (i.e., fear) to portray suffering from smoking-related diseases in motivating them to quit compared to ads that use humorous emotion to portray smoking-related diseases?

RQ₅: How do Taiwanese smokers perceive the effectiveness of anti-smoking television ads that feature real smoker victims to portray suffering from smoking-related diseases in motivating them to quit compared to ads that use actors?

RQ₆: How do Taiwanese smokers perceive the effectiveness of anti-smoking television ads that feature people who share sociodemographic characteristics (i.e., age, sex and race) with them in motivating them to quit than ads that feature people who do not share characteristics?

3.10 ADVERTISEMENT CATEGORIZATIONS

Ads were purposively selected to answer study questions based on contrasting ad content and style, as represented in Table 2.1. Ads were categorized into: 1) use testimonials or not; 2) graphic portrayal of smoking-related diseases or not; and 3) level of negative emotional arousal produced by ads, using definitions provided by the

researcher and previous studies (National Cancer Institute, 2008; Durkin et al., 2009, 2011; Wakefield et al., 2011). Testimonial ads are defined as the ads that feature real people and portray these people describing their 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 are defined as the ads that show graphic or visceral imagery of bodily harms to organs or people's appearance (National Cancer Institute, 2008; Durkin et al., 2009, 2011; Wakefield et al., 2011). Highly emotional ads are defined as the ads that use emotional engagement and arousing content to express and elicit negative emotion such as discomfort, disgust, fear, anxiety or sadness (National Cancer Institute, 2008; Durkin et al., 2009, 2011; Wakefield et al., 2011). The characteristics and brief description of each of the eight selected ads are contained in Table 3.2. All of the ads were 30 seconds in duration. Three ads had been produced and broadcast in Taiwan (two testimonials: *Duo* and *COPD*; one humor: *Smile*). The other five ads were adapted from ads produced and shown to be effective in their countries of origin (two testimonials: *Candle* and *Oral cancer*; two visceral imagery: *Artery* and *Sponge*; one industry manipulation: *1200 dead*). All five ads produced in English were provided with Chinese textual overlay. *Candle* and *Oral cancer* remained intact with speech of the original version to present testimonials' original voice and emotions. *Sponge* and *Artery* were dubbed into Chinese. *1200 dead* did not involve dubbing because it did not contain audio. *Sponge* was the only ad produced in English that had previously been broadcast in Taiwan. The end-frames of the five ads were replaced with a Taiwanese national quitline tagline that was equivalent to the Taiwanese ads.

Five pairs of ads that contrast with each other on particular characteristics of interest (i.e., ad content and style, and characters' demographics) were developed to answer the six research sub-questions (Table 3.3). The first pair was to compare two graphic ads, one (*Artery*) that employed visceral imagery of smoking-related bodily harms and the other (*Sponge*) that used metaphors that is less disgust provoking to illustrate the harms. The second pair was to compare two testimonial ads, one (*Candle*) that graphically portrayed real people suffering from smoking-related diseases in an emotionally evocative way, and the other (*Duo*) that less graphically and emotionally portrayed real people suffering from smoking-related diseases. This pair also contrasted in congruence of demographic characteristics of the people featured in ads and the smokers who were exposed to the ads; one (*Candle*) that featured a white woman who did not share demographic characteristics of participants and the other (*Duo*) that featured Taiwanese men who shared demographic characteristics of participants. The third pair compared a testimonial ad (*Candle*) with a graphic ad (*Artery*). The fourth pair compared a testimonial ad (*Oral cancer*) with a humorous ad (*Smile*); one that evoked negative emotion, such as fear and disgust, and the other that evoked positive emotion, such as humor. The last pair compared two testimonial ads; one (*Candle*) that featured real people and the other (*Oral cancer*) that used actors.

3.11 STUDY SAMPLE

The study took place in a southern city in Taiwan, where the male smoking prevalence is somewhat lower than the national average (28.0% vs. 33.5%) (Taiwan Bureau of Health Promotion, 2013). The current study employed a purposive sampling strategy (Patton, 2002). The city was chosen as a convenient sample, because the

researcher resided in and had convenient access to the city. People were eligible to participate if they were male; aged 18 to 34 years; had smoked at least 100 cigarettes in their lifetime; and had smoked at least once in the previous week. This sex group was selected for study because substantially more males than females smoke in Taiwan (33.5% vs. 4.4%). This age group was chosen because smoking prevalence reaches its peak in this age group (Figure 1.1), when young adult male smokers transition to become established smokers. Furthermore, prior formative research in ten LMICs found that male smokers generally responded differently to anti-smoking television ads compared to female smokers, such as giving ads lower ratings (Wakefield, 2011). Given the substantially higher smoking prevalence among males than females in Taiwan and the potential issues regarding focus group dynamics in mixed sex groups, the study interviewed male smokers only.

Participants were recruited by flyers posted on and/or distributed through social media, internet discussion boards, and on bulletin boards in the public transportation system, convenience stores, businesses and public service agencies. Participants were pre-screened for eligibility, using a recruitment screening form (Appendix D). Participants were then allocated to different groups based on their quit intention (i.e., intend to quit in the next six months vs. not) and educational attainment (i.e., high school or less vs. more than high school), thereby producing relatively homogenous focus groups. Focus group interviews typically use a purposive sampling approach to select and collect data from a relatively homogeneous subgroup (Patton, 2002). Segmentation was done by quit intention because smokers who are thinking about quitting generally give higher ratings to anti-smoking ads than those who are not contemplating quitting

(Wakefield, 2011). Segmentation by educational status was due to a number of issues. First, smokers from lower SES groups in high-income Western countries are more likely to quit smoking or call quitlines after exposure to highly emotional testimonials compared to other types of ads (i.e., ads that are not highly emotional, do not include testimonials, or both) (Durkin et al., 2009, 2011). The formative research in ten LMICs found that smokers with lower educational attainment generally gave higher rating to anti-smoking ads compared to smokers with higher educational attainment (Wakefield, 2011). Secondly, Taiwanese smokers with lower educational attainment have the highest smoking prevalence (Taiwan Bureau of Health Promotion, 2013), suggesting that they are less responsive to tobacco control policies and campaigns than those with higher educational attainment. Therefore, participants were stratified by their quit intention and educational attainment, to the extent that it was possible, in order to produce relatively homogeneous focus groups.

The study involved conducting ten focus groups (Table 3.4). The number of participants in each focus group averaged 5 participants (range from 2 to 9). Appendix E shows the steps that focus group participants went through in participating in the study.

3.12 DATA COLLECTION PROCEDURES

Data were collected between May 2012 and August 2012. Data collection involved four phases: 1) survey of individual sociodemographics and smoking-related perceptions and behaviors; 2) individual ratings of ads before the focus group began; 3) focus group discussions about the ads; and 4) a follow-up telephone survey conducted one week after the focus group session to assess recall. The first three phases were conducted by a

moderator (i.e., the researcher) in a conference room equipped with a projector and audio in a quiet, private setting; the sessions lasted approximately two hours on average.

In the beginning of the focus group activities, participants were given information about the study including its purpose, methods, procedures, confidentiality, risks, and benefits (Appendix F). Phase one involved self-administration of a questionnaire to collect information about participants' sociodemographics such as age, sex, and education, daily cigarette consumption, intention to quit in the next six months, and knowledge of smoking-related harms.

In phase two, participants were shown an anti-smoking ad two consecutive times, after which they were asked to rate the ad, and each of the remaining ads were evaluated in the same way. During the process participants were asked not to talk to each other when viewing and rating ads. To minimize any potential effect of ad viewing order, each group viewed the ads in a different order.

Phase three involved semi-structured group discussions to assess participants' comprehension, acceptability, and perceived effectiveness of each ad, individually as well as its relative effectiveness when compared to specific ads with which it was paired (Table 3.3). This phase was audio-recorded. The moderator explained recording and confidentiality of participant information, as well as the importance of honest opinions. The moderator led group discussions to prompt participants to share their understandings and perceptions of the ads. The moderator used a semi-structured Moderator Guide (Appendix G) to facilitate and structure focus group discussions. At the end of the session, participants were given an incentive as compensation for their time (\$17 cash).

The moderator wrote field observation notes immediately after each focus group session. In conjunction with the focus group transcripts, these notes provided supplementary information on focus group dynamics, including non-verbal cues of individuals, description of the participants and environment (the conference room), methodological and analytic observations, and quality of focus group.

Phase four of data collection involved a further check on the ads that produced the greatest impact. Each participant was followed up by a telephone call to assess the recall of the ads one week after the focus group session.

3.13 MEASUREMENTS

Data collection involved a self-administered advertisement rating questionnaire (Appendix H), followed by semi-structured focus group discussion (Appendix G) and a follow-up telephone survey (Appendix I).

The first section of the questionnaire included collection of participants' demographic information regarding sex (male, female), age, education ('elementary school or less' coded as 1, 'middle school' coded as 2, 'technical school' coded as 3, 'high school' coded as 4, 'university or above' coded as 5), and income ('NT\$20,000 or less' coded as 1, 'NT\$20,001 to NT\$40,000' coded as 2, 'NT\$40,001 to NT\$60,000' coded as 3, 'NT\$60,001 to NT\$80,000' coded as 4, 'NT\$80,001 to NT\$100,000' coded as 5, 'NT\$100,001 to above' coded as 6). Smoking-related questions included number of cigarettes smoked daily ('I don't smoke everyday' coded as 1, 'up to 5 per day' coded as 2, '6-15 per day' coded as 3, 'more than 15 per day' coded as 4), intention to quit in the next six months ('yes' coded as 1, 'no' coded as 0), and previous quit attempts in the

previous twelve months ('yes' coded as 1, 'no' coded as 0). Participants' knowledge of smoking-related harms was assessed by questions that asked participants to indicate whether a particular disease is caused by smoking including those described in the ads ('yes' coded as 1, 'no' coded as 0, and 'don't know' coded as 9).

The second section of the questionnaire asked participants to rate each ad immediately after they were shown the ad twice in a row. To assess the comprehension, acceptability, and perceived effectiveness of the ads, the ad rating questions were modified from the Wakefield and colleagues' rating scale that involves ten rating items for each ad on a separate page (Wakefield et al., 2011). These items assessed participant comprehension (i.e., 'the ad is easy to understand'), novelty (i.e., 'the ad teaches me something new'), credibility (i.e., 'the ad is believable'), negative emotional arousal (i.e., 'the ad makes me feel uncomfortable'), and personal relevance (i.e., the ad speaks to people like me) of the ads. Perceived effectiveness of the ads was assessed through a number of items (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'). These measures reflect key constructs in the central processing route from message exposure to persuasion, according to the ELM (Petty and Cacioppo, 1986). Each item was measured on a 5-point Likert scale with 1 coded as 'strongly disagree', 2 'disagree', 3 'neither agree nor disagree', 4 'agree' and 5 'strongly agree'. Scores for each item were assessed individually, except for the perceived effectiveness (PE) scale, which included five items that were averaged together with good internal consistency (Cronbach alpha ranges from 0.79 to 0.87 across ads).

After all ads had been rated individually, participants were asked to select and rank three ads that made them feel most likely trying to quit smoking, followed by the ranking of the three ads that least motivated them to quit. Participants were then asked to compare five pairs of ads that contrast with each other on particular characteristics of interest (e.g., testimonials vs. non-testimonial, graphic vs. less or no graphic portrayal of harms, or high vs. low negative emotional arousal) as shown in Table 3.3.

The semi-structured questions used in group discussions also explored participant comprehension, acceptability, and perceived effectiveness of the ads (see Appendix G). The question “How does this ad make you feel?” was used to assess emotional arousal and its valence, and the question about learning new information for ads assessed novelty. Three questions that assessed the comprehension aspect were “What do you think is the main message of the ad?”, “What do you understand about the ad?” and “What do you think is unclear or do you not understand about the ad?”. Two questions that assessed credibility and personal relevance were, “How relevant do you think the ad is to you?”, and “What do you think about the believability of the ad?”. Three questions that assessed effectiveness were “How effective do you think the ad is in motivating you to quit smoking?”, “What element of the ad makes you think about quitting?” and “Why do you think the ad motivates (or does not motivate) you to quit smoking?”

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 ads they could recall from the focus group session. Recall was determined by whether the ad was correctly described by participants (Grover & Vriens, 2006). For each confirmed recalled ad, questions used to assess the engagement of the recall were: 1) whether participants

had thought about the ad; 2) whether participants had discussed the ad with anyone, 3) whether participants thought the ad was an effective anti-smoking ad; 4) whether participants had tried to quit smoking between the focus group session and follow-up.; and 5) whether the ad recalled by participants made them try to quit smoking between the focus group session and follow-up. Responses were ‘yes’ coded as 1, ‘no’ coded as 0, and ‘don’t know’ coded as 9.

3.14 DATA ANALYSIS

Quantitative analysis of ad rating was performed using STATA, version 11.2 for Windows (StataCorp, College Station, TX, USA). Means were used to describe ratings for each ad (see Table 5.3). Proportions were used to describe and identify the most and least effective ads (see Appendix L, Table L.1), as well as ads recalled by participants at follow up (see Table L.2). A two-way ANOVA omnibus assessment of differences in ratings by ads was conducted and accounted for the random effect of an individual’s response and the fixed effect of ads. When ANOVA results indicated significance in ratings among ads, post-hoc paired t-tests were then conducted to test all pairwise differences among ratings for significance (see Table 5.3) (Salkind, 2010). Analyses were re-run after stratification of groups by educational attainment and quit intention (See Table L.3). For sensitivity analyses, Tukey’s honestly significant difference (HSD) post-hoc test was also conducted to test all pairwise differences among ratings for significance (see Table L.4) (Salkind, 2010). The Tukey’s HSD test was chosen because the sample size is the same for each ad (n=54), it is relatively robust to violations of the normality assumption, fully controls the probability of making Type 1 errors, and provides

conservative probability (Salkind, 2010). Analyses were re-run after stratification of groups by educational attainment and quit intention (See Table L.5).

Independent sample t-tests were conducted to examine participants' mean PE ratings of each ad by educational attainment and quit intention groups (see Table L.6).

Qualitative analysis of focus group discussions was undertaken using NVivo, version 10 for Windows (QSR International, Victoria, Australia). Focus group transcripts were coded and analyzed following a sequence of five interrelated steps: reading the transcripts, coding the transcripts, displaying coded data, reducing to essential points, and interpreting the data (Maxwell, 2005; Uline et al., 2005). A step-by-step analysis procedure is described in the next section.

3.14.1 Transcribing and reading data

The recordings of focus group discussions were transcribed into MS Word and imported into NVivo in Chinese by the researcher (a bilingual native Chinese speaker), resulting in a verbatim transcription including various interactional verbal and non-verbal cues for coding and analysis. The field observation notes and research memos that the researcher compiled during the data collection provided supplementary data for analysis. The transcription, field notes, and research memos were generated in Chinese and remained in its original language for analysis. The researcher conducted data analysis and interpretation in English and ensured the translation of quotes accurately representing the original meaning of transcripts.

3.14.2 Coding transcripts

The message-related and psychosocial constructs in the conceptual model (Figure 3.2) informed the development of data codes, as well as the analysis process of identifying similarities, differences, and patterns within and across focus groups. Three types of codes were used to code transcripts and research memos: organizational codes, theoretical codes, and substantive codes (Maxwell, 2005). Organizational codes reflected the structure of questions in the moderator guide to enhance the researcher's ability to organize multiple discussions and topics across groups. Theoretical codes were developed a priori from the conceptual model in hierarchical organization. Substantive codes were inductively developed through open coding (Maxwell, 2005), a process that assigns a word or phrase that best captures the meaning of the text segment.

The code book (Appendix J) based on semi-structured discussion questions and conceptual model were modified as reading, transcribing and coding the interview transcripts, and memos. Memos facilitated the researcher to critically think about qualitative data and study design and to deal with emerging themes⁸ or situations during the field work.

3.14.3 Displaying data

A matrix to organize and display focus groups' responses across ads and across each focus group was used to examine the similarities and differences in their comprehension, acceptability and perceived effectiveness of anti-smoking ads on their smoking/quitting-related knowledge, attitudes and behaviors (Appendix K). All the issues

⁸ Themes are patterned responses or meanings that capture essential points within the data set related to research questions (Braun & Clarke, 2006).

and opinions expressed during group discussions were documented and taken into consideration in order to determine the extent to which the responses to ads could be generalized within and across groups.

3.14.5 Interpreting data

Taken together, the results of ad rating questionnaires and focus group discussions were examined and compared to determine consistencies and primary themes across quantitative individual data and qualitative group data. The results from ad rating questionnaires provided a quantitative summary of how the ads perform on a number of key dimensions under evaluation (see results in Chapter 5 Manuscript and additional analyses in Appendix L).

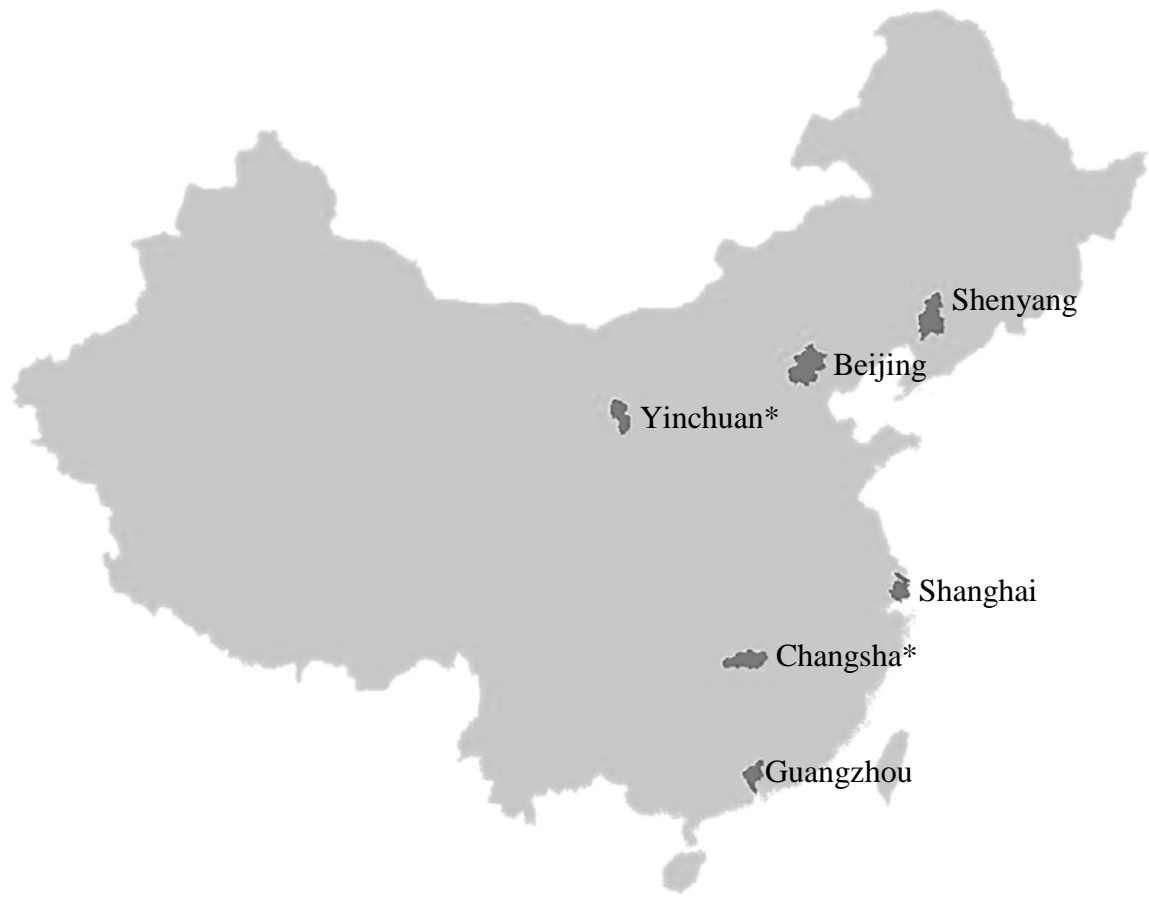


Figure 3.1 The geographical location of the ITC China Survey cities

Note. *Control cities.

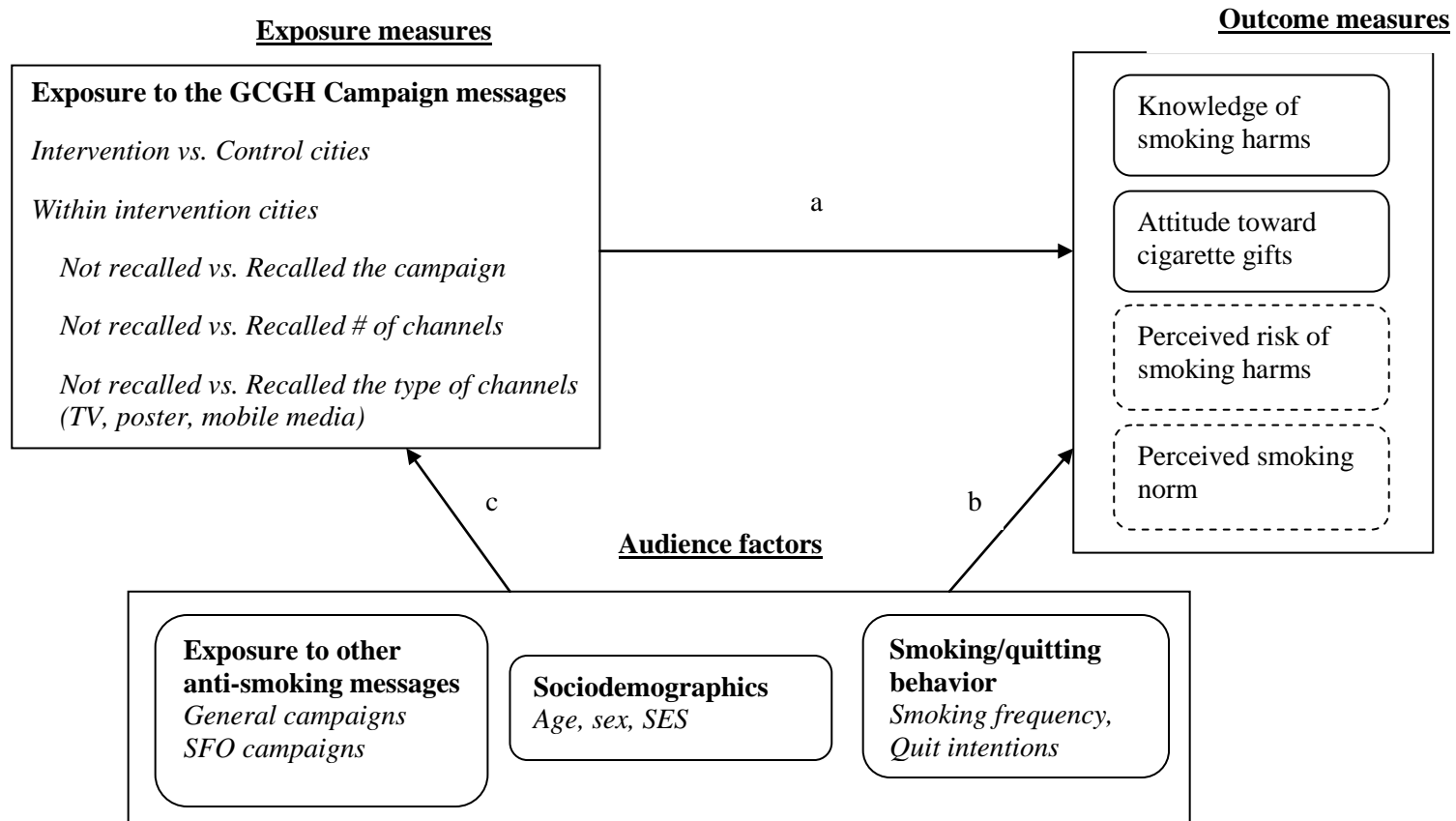


Figure 3.2 The conceptual model for Study One

Note. 1. ^{a, b}See Table 4.3 and 4.4, where knowledge and attitude measures are dependent variables, exposure measures are independent variables, and audience factors are control/adjustment variables. The two outcome measures, perceived risk of smoking harms and perceived smoking norms, in the dot-lined rectangles are not included in the manuscript for Study One but in the Appendix C.; 2. ^cSee Table 4.1, where exposure measures (not recalled vs. recalled within intervention cities) are dependent variables and audience factors (i.e., sociodemographics, smoking/quitting behavior) are independent variables.

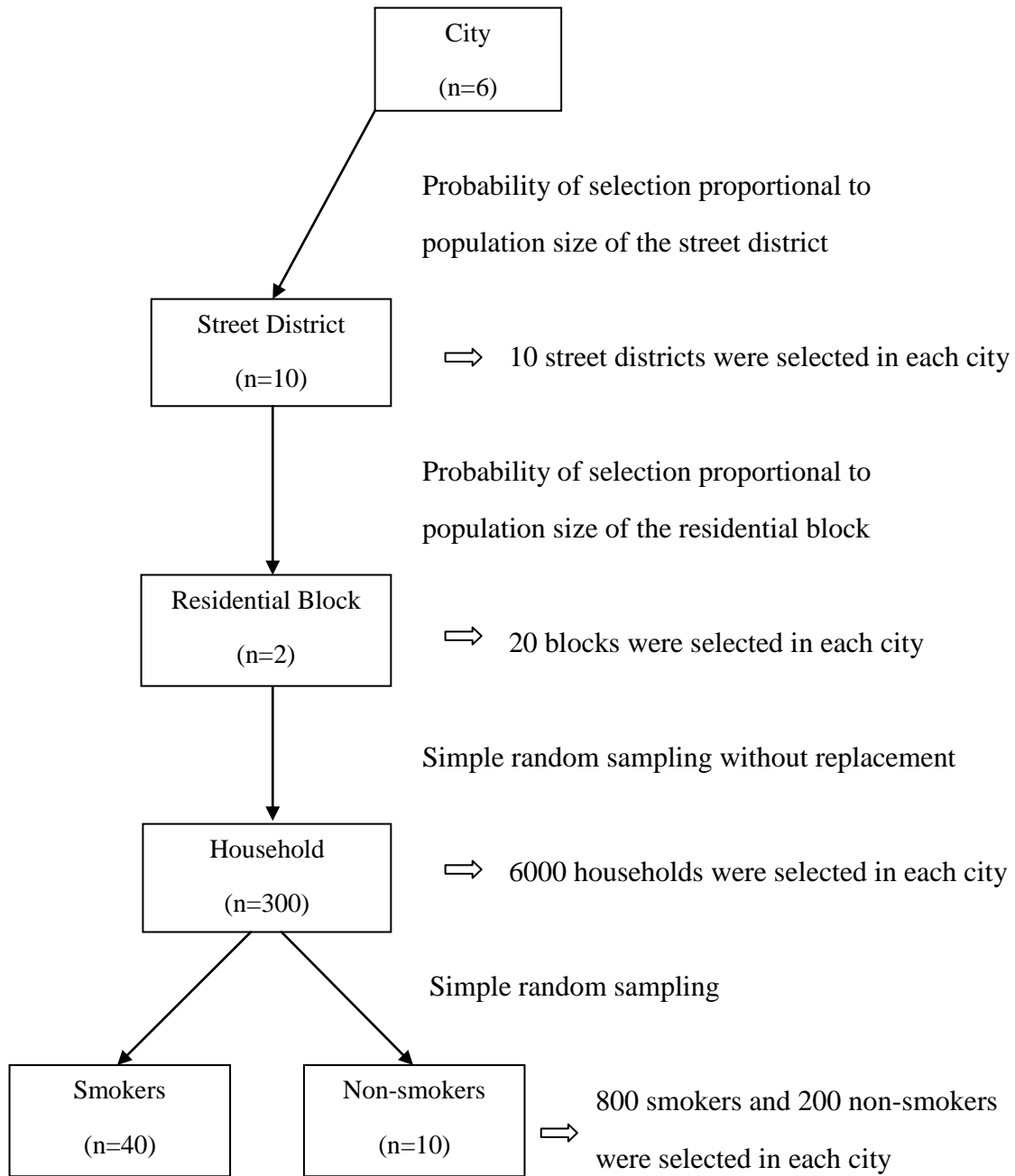


Figure 3.3 Participant selection process in each city for Study One

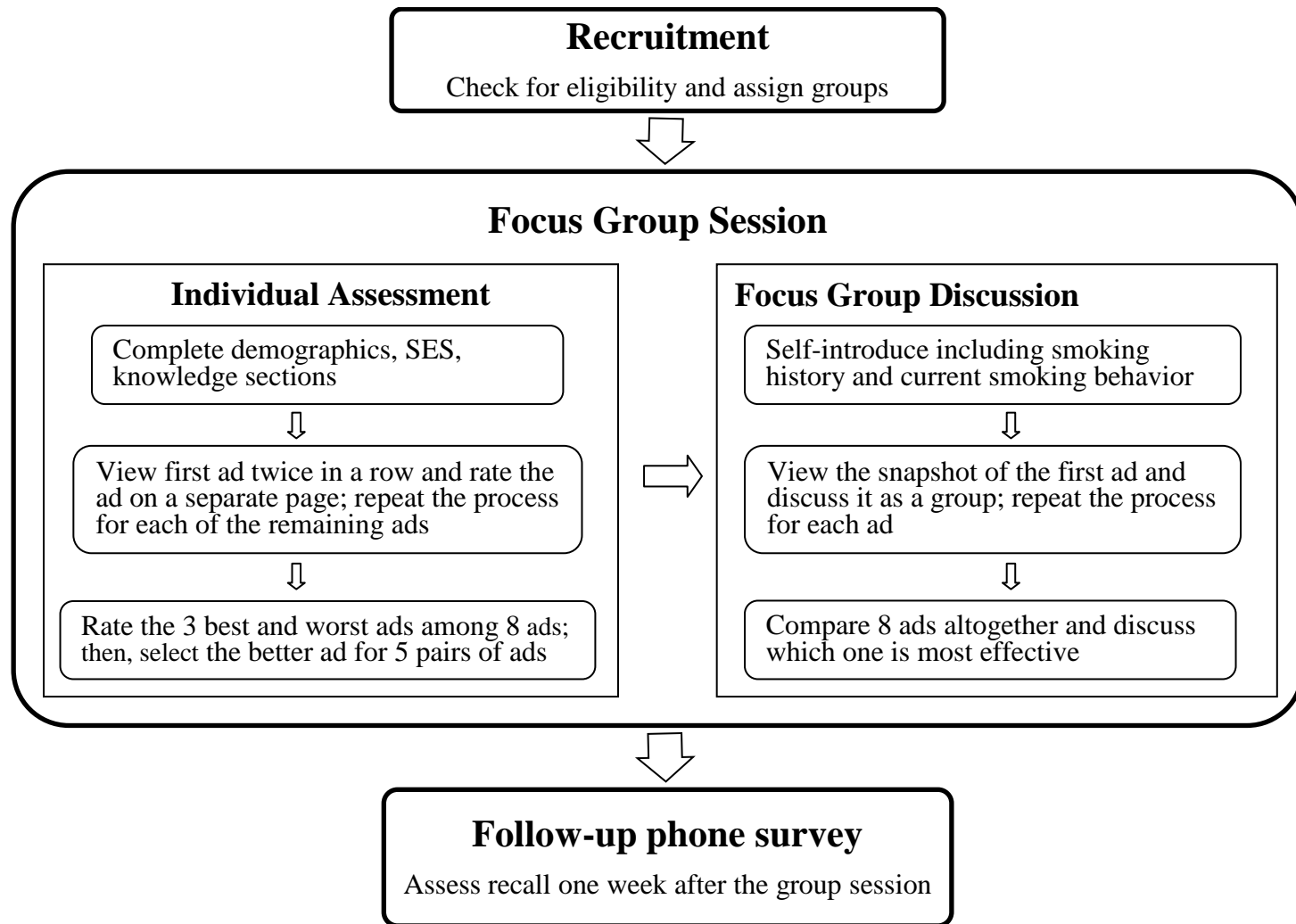


Figure 3.4 Data collection procedures for Study Two

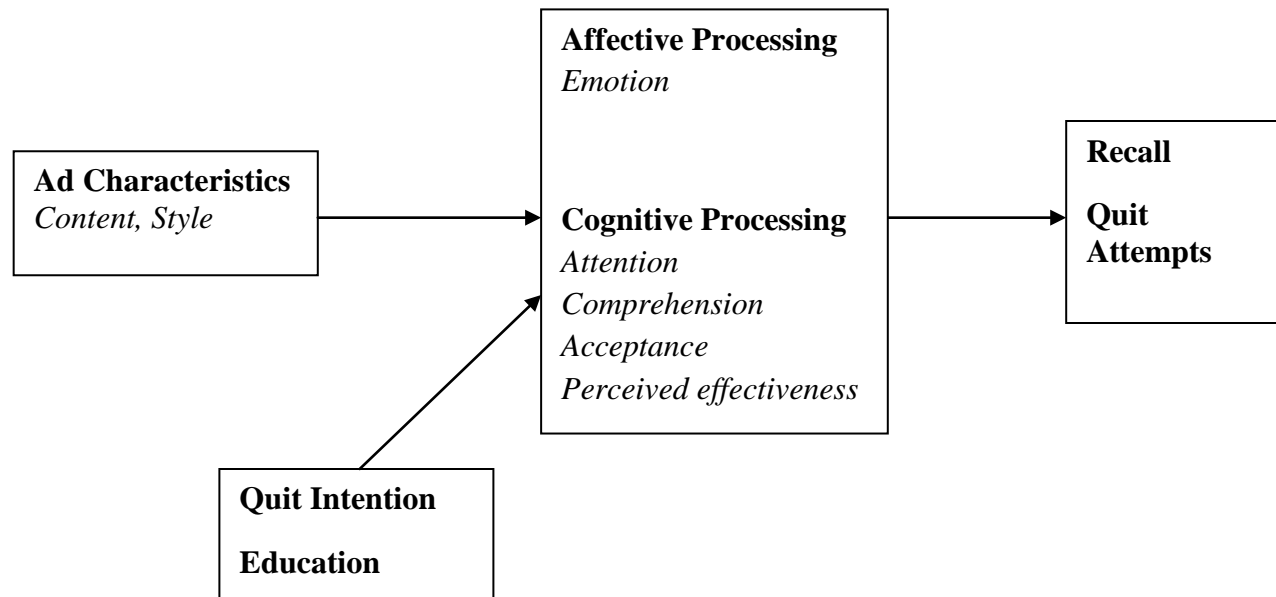


Figure 3.5 The conceptual model for Study Two

Table 3.1 Operationalization of Measurements for Study Two

Variable	Item wording	Response Format
Campaign exposure	Have you ever seen the campaign "Giving cigarettes is giving harm"?	Yes, no
	Where have you seen the campaign "Giving cigarettes is giving harm"? Three channels, TV, poster, mobile media, were asked in an individual question respectively.	Mentioned, not mentioned
Knowledge of smoking-related harms	Question Stem: Based on what you know or believe, does smoking cause ...	
	Stroke	Yes, no, don't know
	Lung cancer in smokers	Yes, no, don't know
	CHD	Yes, no, don't know
	Index	4-point scale, ranging from 0 to 3
Attitude toward cigarette gifts	Cigarette are good gifts for family or friends (asked only at the post-campaign survey).	5-point Likert scale, extent of disagreement
Perceived risk of smoking harms	How worried are you, if at all, that smoking will damage your health in the future?	Not at all, a little, very much
	In the last month, how often, if at all, did you think about the harm your smoking might be doing to you?	Never, occasionally, often
Perceived smoking norm	What is Chinese society's attitude toward smoking?	Support, disapprove, neither
Sociodemographics	Age	Age group: 18-24, 25-39, 40-54, 55+
	Gender	Male, female
	Marital status	Married or living together, divorced or separated or widowed, single

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	In the last year, on average how much was the total income per month of your household?	Low (3000 yuan and under), medium (3001-5000 yuan), high (5001 yuan or above)
	What is your highest education?	Low (elementary school or below), medium (junior high school or high school/technical high school), high (college or above)
Smoking/quitting status	Do you smoker everyday or somedays?	Daily smoker, someday smoker
	Heaviness of smoking index (HSI)/ An index calculated from the amount of cigarette consumption (On average how many cigarettes do you smoke each day?) and the time to the first cigarette after awake (How soon after waking do you usually have your first smoke?)	7-point scale, ranging from 0 to 6 0 to 10 cigs, 11 to 20 cigs, 21 to 30 cigs, and more than 31 cigs for cigarette consumption. more than 61 mins, 31 to 60 mins, 6-30 mins, and less than 6 mins for the first cigarette after awake.
	Are you planning to quit smoking?	Not planning to quit, within the next month, within the next six months, beyond six months/sometime in the future
General anti-smoking campaign exposure	In the last six months, have you ever seen advertising or information that talks about the dangers of smoking, or encourage quitting?	Never, once in a while, often
Smoke-free Olympics campaign exposure	In the last 6 months, have you ever seen advertising or information that talks about the dangers of smoking, or encourage quitting?	Yes, no

Table 3.2 Characteristics and descriptions of the eight television ads for Study Two

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, warn people about the danger of smoking, and persuade people to quit before it's too late.
	Duo (TW)	No	Low	Two well-known 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 well-know 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	An actress played as an oral cancer victim speaks to the camera about the fact that smoking causes all cancers in an emotionally evocative way. The actress' cancerous mouth is zoomed out from a graphic image of oral cancer on the cigarette warning label.
Graphic image and Scientific evidence	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 U.S. 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 disease.

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; Ads can be viewed upon request.

Table 3.3 Comparison of five paired ads on contrasting content and style for Study Two

Question	Ad name	Testimonial	Graphic	Negative Emotion	Key contrasting characteristics
RQ ₁	Artery	No	Yes	High	Visceral imagery of bodily harms
	Sponge	No	Yes	Low	Visual metaphors of bodily harms
RQ ₂ and RQ ₆	Candle	Yes	Yes	High	Highly emotional and graphic portrayal; people featured in ads do not share demographic characteristics (i.e., race and gender) of the smokers who view the ads
	Duo	Yes	No	Low	Less emotional and graphic portrayal; people featured in ads share demographic characteristics (i.e., race and gender) of the smokers who view the ads
RQ ₃	Candle	Yes	Yes	High	Testimonial
	Artery	No	Yes	High	Visceral imagery of bodily harms
RQ ₄	Oral cancer	Yes	Yes	High	Negative emotional arousal (i.e., fear and disgust)
	Smile	No	No	Low	Positive emotional arousal (i.e., humor)
RQ ₅	Candle	Yes	Yes	High	Real people
	Oral cancer	Yes	Yes	High	Actor

Note. Ads can be viewed upon request.

Table 3.4 Focus group structure for Study Two

Group	Number of participants	Education		Quit intention	
		High	Low	Yes	No
A	9	9	0	9	0
B	4	3	1	1	3
C	4	4	0	1	3
D	5	5	0	1	4
E	6	6	0	6	0
F	6	6	0	1	5
G	2	0	2	2	0
H	6	0	6	1	5
I	9	0	9	2	7
J	3	0	3	2	1
Total	54	33	21	26	28

CHAPTER 4

IMPACT OF THE “GIVING CIGARETTE IS GIVING HARM” CAMPAIGN ON KNOWLEDGE AND ATTITUDES OF CHINESE SMOKER⁹

⁹ Li-Ling Huang, James F. Thrasher, Yuan Jiang, Qiang Li, Geoffrey T. Fong, Yvette Chang, Katrina M. Walsemann, and Daniela B. Friedman. To be submitted to *Tobacco Control*.

4.1 ABSTRACT

4.1.2 Objective

To date there is limited published evidence on the efficacy of tobacco control mass media campaigns in China. This study aimed to evaluate the impact of a mass media campaign “Giving Cigarettes is Giving Harm” (GCGH) on Chinese smokers’ knowledge of smoking harms and attitudes toward cigarettes as gifts.

4.1.2 Methods

Population-based, representative data were analyzed from 3709 adult smokers who participated in the International Tobacco Control (ITC) China Survey conducted in six cities in China before and after the campaign. Logistic regression models were estimated to examine associations between campaign exposure and attitudes about cigarettes as gifts measured post-campaign. Poisson regression models were estimated to assess the effects of campaign exposure on post-campaign knowledge, adjusting for pre-campaign knowledge.

4.1.3 Findings

Fourteen percent (n=335) of participants recalled the campaign within the cities where the GCGH campaign was implemented. Participants in the intervention cities who recalled the campaign were more likely to disagree that cigarettes are good gifts (71% vs. 58%, $p<0.01$) and had greater levels of campaign-targeted knowledge than those who did not recall the campaign (Mean=1.97 vs. 1.62, $p<0.01$). Disagreeing that cigarettes are good gifts was higher in intervention than in control cities, when adjusting for

sociodemographics, smoking-related variables, and exposure to other antismoking campaigns. Changes in campaign-targeted knowledge were similar in both cities, perhaps due to contamination issues.

4.1.4 Conclusions

These findings suggest that the GCGH mass media campaign increased Chinese smokers' disapproval of giving cigarettes as gifts, and may have increased knowledge of smoking harms, which could promote downstream cessation. Findings provide evidence to support future campaign development to effectively fight the tobacco epidemic in China.

4.2 INTRODUCTION

The World Health Organization's Framework Convention on Tobacco Control (WHO-FCTC) recommends implementing national anti-smoking mass media campaigns to educate the public about the dangers of tobacco use.¹ Mass media campaigns significantly reduce smoking initiation among youth, increase smoking cessation among adults,²⁻⁷ decrease the social acceptability of smoking, and establish smoke-free norms.^{2,3}^{8,9} Most studies of mass media campaigns have been conducted in high-income countries. Research in low- and middle-income countries (LMICs) is needed to assess the extent to which campaign materials and dissemination strategies need to be adapted to specific sociocultural contexts in order to be effective.^{9,10}

Evidence from high-income countries has shown consistently that anti-smoking advertisements that arouse strong emotions, display graphic, serious consequences from smoking, and/or use highly emotional testimonials have greater impact than those without

such features.^{2 3 6 11-13.} Similarly, emerging evidence from population-based studies suggests that graphic portrayals of serious smoking consequences are effective with smokers in LMICs.^{14 15} Formative research on anti-smoking advertisement strategies in ten LMICs, including China, found that emotionally arousing graphic messages are most likely to be perceived as effective, while results are more mixed for other message types, such as personal testimonials.⁹ The variable responses to certain types of messaging strategies across countries highlights the critical need for evaluation of tobacco control mass media campaigns to ensure cultural appropriateness and maximize their effectiveness. This research is critical for countries like China, where tobacco use is normative and where tobacco-related mortality is increasing.^{16 17}

China is the largest cigarette market in the world, with about 301 million smokers who represent one-third of the world's smokers and who consume 38% of the world's cigarettes.^{16 17} According to data from the 2010 Global Adult Tobacco Survey (GATS) in China, most Chinese men smoke (52.9%), whereas very few Chinese women smoke (2.4%).¹⁶ The Chinese government has not made tobacco control a high priority in its health reform plan and has allocated only 0.5% of its disease control and prevention budget to tobacco control efforts, even though it has ratified the WHO FCTC.¹⁸ Indeed, the State Tobacco Monopoly Administration is the authority in China that regulates health warning labels on cigarette packing and oversees China National Tobacco Corporation.¹⁸ As a state-owned monopoly and the world's largest and most profitable tobacco company,¹⁹ the Chinese government has conflicting interests around the regulation of tobacco production/marketing and tobacco control.^{18 20 21 22}

Few large-scale anti-smoking mass media campaigns were implemented in China before 2008. In 2008, the Chinese government launched sub-national anti-smoking mass media campaigns, i.e., “Smoke-free Beijing” (SFB) and “Smoke-free Olympics” (SFO), to discourage smoking, particularly in smoke-free places, in order to fulfill its obligation of ensuring a smoke-free Beijing Olympics. SFO campaign materials usually involved positive, celebratory tones, used humorous appeals, and conveyed limited information about smoking-related harms. Some SFB campaign materials were similar, but other materials featured graphic depiction of smoking harms. Scarce published and anecdotal evidence suggests that some campaigns were relatively successful,²³ although one study suggests that the effects of SFO campaigns were limited and did not significantly reduce smoking in workplaces and restaurants.²⁴ This lack of reduction in smoking in key public venues over time (2006-2009) was also found by the ITC China Project.²⁵

In partnership with the WHO and World Lung Foundation, China launched the “Giving Cigarettes is Giving Harm” (GCGH) campaign in 2009 to raise awareness of tobacco-attributed diseases and reduce the social acceptability of giving cigarettes as gifts, a common practice for establishing and maintaining interpersonal relationships in Chinese society.^{26 27} Gifting and sharing cigarettes significantly promotes smoking and hinders cessation efforts among Chinese smokers.^{28 29} To discourage people from gifting cigarettes, campaign messages equated gifting cigarettes to loved ones and colleagues with giving them omens that portend future diseases and death from smoking. The campaign’s novel strategy of situating graphic imagery of harm within the context of a socially engrained and respected practice warrants evaluation. Limited evidence suggests

that the campaign was effective in raising the awareness of smoking-attributed diseases among Chinese.²⁹

These evaluation studies were limited by design issues such as non-representative samples, the lack of control groups, and the inability to determine the association between campaign exposure and individual-level change in campaign-targeted outcomes due to using repeated cross-sectional designs.³⁰ Formative pre-testing of messages in ten LMICs including China provided preliminary evidence of message types that are likely to be effective in China – namely, those that use strong graphic and visceral imagery or personal testimonials to depict serious consequences of smoking.⁹ However, this formative study did not evaluate messaging strategies under naturalistic conditions of exposure.

The present study aims to overcome limitations of prior research by using a population-based, longitudinal cohort of adult smokers to evaluate China's first-ever anti-smoking mass media campaign to graphically portray tobacco-attributed diseases and to attempt to change social norms around cigarette gifting. We compared campaign-targeted knowledge and attitudes using two campaign exposure assessments: (1) smokers who lived in the cities where the GCGH was and was not implemented; and (2) smokers who recalled and did not recall the campaign within the intervention cities. Furthermore, we examined the associations between campaign-targeted knowledge and attitudes and the number and type of media channels (i.e., TV, posters, mobile media¹⁰) through which participants recalled campaign exposure within the intervention cities. We hypothesized

¹⁰ Mobile media refers to television screens where advertisements are placed on city buses and subway trains

that campaign exposure would be positively associated with increases in campaign-targeted knowledge and negative attitudes toward cigarettes as gifts. The results will strengthen emerging evidence regarding effective campaign content in China, which can be used to develop future campaigns to fight the tobacco epidemic in China.

4.3 METHODS

4.3.1 Study sample

A stratified multi-stage cluster sampling design was used to select a population-based, representative sample of approximately 800 adult smokers in each of six Chinese cities that were included in the International Tobacco Control (ITC) China Survey, a longitudinal cohort survey in China, designed to be parallel to surveys being conducted in 21 other countries of the ITC Project.³¹ To the extent possible, participants were followed and re-interviewed, but in order to maintain sample size over time, participants lost to follow-up were replaced using the same sampling frame constructed at Wave 1.³¹ For the current study, we analyzed data from wave 2, which were collected from October 2007 to January 2008, one year before the campaign started, and from Wave 3, collected from May to September 2009, a period that started three months after the campaign ended. The analytic sample for the current study included adult smokers, who had smoked at least 100 cigarettes in their lifetime. A total of 4732 smokers were surveyed at the Wave 1 with response rates from 39% to 66% and cooperation rates from 80% to 95% in six cities. The average retention rates for Waves 2 and 3 were both 81%. The 3709 smokers who completed the Wave 2 and 3 surveys constituted the analytic sample for this study. Hereafter these two waves are referred to as “baseline” or “pre-campaign” and “follow-

up” or “post-campaign.” Additional information can be found in the ITC China Survey Technical Report.³²

4.3.2 Campaign materials and channels

The GCGH campaign included a 30-second television (TV) advertisement and three posters.^{33 34} The campaign aired on regional and satellite TV, mobile media on city buses and subway trains, on outdoor electronic billboards, and in hospitals and community centers for four weeks from January through February 2009 in Beijing, Shanghai, Tianjin, Shenyang, Guangzhou, Shenzhen, and Shaoguan.³⁵ During the same period, the posters were also distributed to more than 30 cities where media broadcast was not achieved.³⁵ Campaign messages in the TV advertisement and one poster were the same: “You send your wishes with lung cancer and other respiratory diseases to your friends; you send your respects with heart disease, stroke, and other cardiovascular diseases to your colleagues; you send your caring with death to your family members.”³³

4.3.3 Measurements

Campaign-targeted knowledge and attitudes

Knowledge of smoking-related harms was assessed in the pre- and post-campaign surveys. Participants indicated whether they believed that smoking causes 1) lung cancer in smokers, 2) strokes, and 3) cardiovascular disease. Participants indicated yes or no to each item, and an index was created for campaign-targeted knowledge with values ranging from 0 to 3.

Attitude towards cigarettes as gifts was assessed in the post-campaign survey only. Participants were asked how much they agreed that cigarettes are good gifts for friends and family on a 5-point Likert scale, and the responses were dichotomized to reflect agreement or not (strongly disagree and disagree vs. agree, strongly agree, and neither disagree nor agree).

Campaign exposure measures

Exposure to the GCGH campaign was assessed with an aided recall question at the post-campaign survey only: “*Have you ever seen the campaign "Giving Cigarettes is Giving Harm"?*” Participants were asked about their past exposure to the GCGH campaign, without any other visual presentation and verbal description of the campaign content. For those who recalled the campaign, exposure through each of three media was assessed: TV, poster, and mobile media. A three-level campaign exposure index was created to indicate no exposure to the campaign (the reference group), exposure to one channel, or exposure to two or more channels.

Four cities in the ITC China Survey – Beijing, Shenyang, Shanghai, and Guangzhou – were among the cities where the campaign was implemented, and these were coded as intervention cities. Two ITC China Survey cities, Yinchuan and Changsha, were coded as control cities, because the campaign (including the poster) was not specifically implemented there, although there may have been some contamination through satellite TV.

Adjustment variables

Sociodemographic variables were assessed pre-campaign and included age, sex, marital status, monthly household income (low=3000 Yuan or less; medium=3001-5000 Yuan; high=5001 Yuan or more), and education (low=elementary school or less; medium=junior high school and high school; high=college/university or more). Smokers were categorized into daily and non-daily smokers. The heaviness of smoking index (HSI) was calculated using information on daily cigarette consumption as well as the time elapsed from waking to smoking the first cigarette of the day, with scores ranging from 0 to 6.³⁶ Intention to quit smoking was measured by whether participants planned to quit within the next six months or not. Exposure to general anti-smoking campaigns was assessed by whether participants reported any exposure to such campaigns in the six months prior to the interview in the post-campaign survey. Participants were asked to indicate whether they had heard of the “Smoke-free Olympics” campaign in the pre-campaign survey.

4.3.4 Analysis

The analyses were conducted using STATA, version 11.2.³⁷ The attrition analysis involved using unadjusted data and conducting chi-square tests and t-tests to examine differences among participants who were followed up and those who were lost to attrition between the two waves (Table 4.1). All other analyses accounted for the multi-stage, cluster sampling design and for sampling weights developed for the longitudinal sample.³¹ Logistic regression was used to examine associations between campaign exposure and attitudes. Poisson regression was used to examine associations between

campaign exposure and post-campaign levels of knowledge, adjusting for pre-campaign levels of knowledge. Since the variance of knowledge measures is slightly smaller than the mean ($1.1 < 1.7$), robust standard errors were obtained to control for minor violation of assumptions for Poisson distribution. Both types of models assessed crude and adjusted estimates of the relationship between exposure and outcomes. Adjusted estimates account for age, sex, income, education, marital status, smoking status, intention to quit, exposure to general antismoking campaign, and exposure to the SFO campaign. For each campaign-targeted outcome, two different analytic samples were used: 1) comparing intervention with control cities, and 2) within the intervention cities, comparing those who reported exposure with those who did not.

4.4 RESULTS

4.4.1 Sample characteristics

The baseline characteristics of participants by follow-up status, residence in intervention or control cities, and campaign recall within the intervention cities are shown in Table 4.1 Those who were lost to follow-up ($n=949$) were more likely than those who were followed ($n=3,709$) to be younger, have higher educational attainment, and have lower household income. Such statistically significant differences in age, education, and household income were also observed between the intervention and control cities. Those who did and did not recall the campaign within the intervention cities only differed in exposure to any anti-smoking campaign in the last six months (77.8% vs. 63.8%).

4.4.2 Campaign exposure assessment and validation

The prevalence of GCGH campaign recall was 14% in the intervention cities (n=335). Among those who recalled the campaign 70% reported that they had seen the campaign on TV, 23% on mobile media, and 25% on posters. When further analyzing the number of the channels to which the 335 participants in the intervention cities reported that they were exposed, 61% of them recalled seeing the campaign on one channel, and 24% recalled seeing the campaign on two or more channels.

To assess the construct validity of the campaign exposure assessment, logistic regression models were estimated by regressing the GCGH campaign exposure on any anti-smoking campaign exposure through the corresponding channels (i.e., TV and poster) in the last six months when assessed at baseline (Table 4.2). The results indicated no statistically significant associations, suggesting that the GCGH exposure measures had discriminant validity (i.e., GCGH campaign recall did not appear to reflect biased reports of anti-smoking campaign exposure when there were no campaign activities). However, statistically significant associations were found for the models regressing the GCGH campaign exposure on any anti-smoking campaign exposure in the last six months when assessed at follow up, suggesting convergent validity for the GCGH exposure measures.

4.4.3 Effectiveness of the GCGH campaign

Campaign-targeted attitude toward cigarette gifts

The percentage of people who disagreed that cigarettes were good gifts was higher in the intervention compared to the control cities (60% vs. 55%, $p=.03$), a statistically significant difference that was maintained in the adjusted model (AOR=1.49, 95% CI:

1.06-2.09; Table 4.3). Within the intervention cities, participants who recalled the campaign were more likely than those who did not recall the campaign to disagree that cigarettes were good gifts (71% vs. 58%, $p < 0.01$; OR=1.75, 95% CI: 1.28-2.41; AOR=1.61, 95% CI: 1.17-2.23). Those who reported having seen the campaign advertisement on one channel were also more likely to disagree that cigarettes were good gifts (OR=2.09, 95% CI: 1.25, 3.50; AOR=2.00, 95% CI: 1.22-3.27) compared to those who did not recall the campaign, even after adjustment for covariates. Among the three channels through which participants recalled campaign exposure, only TV was significantly associated with attitude towards cigarettes as gifts (OR=1.62, 95% CI: 1.02-2.55).

Campaign-targeted knowledge of smoking harms

When comparing intervention and control cities, there was no statistically significant difference in campaign-targeted knowledge after adjusting for baseline levels of knowledge (Table 4.4). However, within intervention cities, we found campaign exposure recall was statistically significantly and positively associated with campaign-targeted knowledge of smoking harms (unadjusted $b = .168$, $SE = .043$, $p < .001$; adjusted $b = .135$, $SE = .041$, $p = .002$).

The number of channels through which campaign exposure was reported was associated with relatively greater levels of campaign-targeted knowledge when compared to participants who did not recall the campaign in intervention cities. The strongest association was found for participants who recalled exposure to the campaign through two or more channels. This finding held in both unadjusted ($b = 0.301$, $SE = .069$, $p < .001$)

and adjusted models ($b=0.244$ $SE=.065$, $p=.001$), with weaker but statistically significant associations found for those who recalled exposure through only one channel (Table 4.4). Reports of exposure to campaign by TV was significantly and positively associated with post-campaign knowledge (unadjusted $b=0.131$, $SE=.044$, $p=.006$; adjusted $b=0.104$, $SE=.040$, $p=.014$). Recall of the campaign through posters was positively associated with post-campaign knowledge only in the unadjusted model ($b=0.152$, $SE=.074$, $p=.047$).

4.5 DISCUSSION

The study is the first large-scale population-based evaluation of a tobacco control mass media campaign conducted in China. The study findings suggest that recall of the GCGH campaign was associated with greater disapproval of gifting cigarettes and with greater increases in knowledge of smoking-related harms. In addition, the findings suggest that the campaign's novel strategy of linking cigarette gifting to images of diseased organs and symbols of death may have begun to reduce the social acceptability of giving cigarettes as gifts. This result is consistent with previous studies on effective tobacco control messaging^{2 3 6 11 12 13} and adaptation of evidence-based messages in sociocultural context.^{9 10}

Recall of the campaign was low (14%), which may have been due to the relatively short duration of the campaign and lengthy time from the campaign's end to the follow-up survey. The duration of the campaign, at least through electronic media, was only four weeks. The post-campaign survey was conducted three months after the campaign broadcast ended, and lasted for five months, which may have resulted in the decay of campaign effects.²

As expected, participants in the intervention cities who recalled the campaign via one or more channels had significantly greater disapproval of cigarette gifts and greater levels of campaign-targeted knowledge of smoking harms, supporting the idea that multimedia interventions can boost campaign effects. These results should be interpreted with some caution given the small number of participants who recalled exposure through more than one channel; however, the enhanced efficacy of campaigns delivered through multiple channels is consistent with standard campaign practice.³⁸ The type of channel through which exposure was recalled was associated with campaign-targeted attitudes and knowledge. TV appears to have been a more effective medium than print and mobile media for reaching and influencing smokers, which is consistent with previous studies.^{2 3} The lack of effects for print and mobile media may be also due to small sample sizes of those who recalled the campaign through these channels, thus we were unable to detect statistically significant differences.

In addition to those already mentioned, several limitations should be noted. The sample was designed to be representative of urban cities in China, therefore results should not be generalized to the rural Chinese population. Given loss to followup (n=949), the results from our study may be limited by attrition bias, one of the main threats to the external and internal validity of longitudinal cohort studies.^{30 39} Those lost to follow-up tended to be younger, have higher educational attainment, and have lower household income. This bias may weaken generalizability of our results to these subpopulations. Furthermore, internal validity may be compromised because study drop-outs may respond differently to campaigns than participants who were successfully followed up. For example, those who were successfully followed up had relatively lower educational

attainment, and studies from high-income countries with long histories of tobacco control have found that low SES smokers have stronger responses to graphic, evocative cessation campaigns than smokers from high SES groups.^{9 11 12} Hence, we may have overestimated campaign effects due to greater retention of less-well educated smokers. However, greater campaign effects among lower SES smokers may occur only in societies where smoking has been concentrated in low SES groups, which is not the case in China. Furthermore, when examining the SES indicator of household income, higher income smokers were more likely to be followed up. Hence, our differential retainment of smokers with lower education but higher income makes it difficult to predict the direction of the bias.

The pre-and-post evaluation surveys were not conducted immediately before and after the GCGH campaign because this study utilized surveys from the ITC China Project, which was designed to measure the effectiveness of national-level tobacco control policies, rather than the campaign alone.³¹ The lengthy period between pre-and-post campaign surveys may have introduced some biases. First, the pre-campaign survey was conducted one year before the campaign was broadcast, which is not optimal given that changes may have taken place between pre-campaign survey and campaign onset. Second, the short duration of the campaign and the lengthy time from the campaign's end to post-campaign survey (three to seven months) may have missed the maximal impact of the campaign as campaign effects decay.² Studies show that the beneficial effect of mass media campaigns appears only within two to three months after exposure.^{40 41} Indeed, this likely helps to explain the low campaign recall rate and the relatively small or non-existent campaign effects. Third, this study is subject to internal validity threats such as

history effects due to the lengthy evaluation timeframe. For example, the SFO initiatives which included mass media campaigns promoting smoke-free environments took place in Beijing, Shanghai, and Shenyang (Olympics cities) before and during Olympics games in August 2008. The timeframe of the SFB campaign (February 2008 to February 2009 in Beijing) also overlapped the GCGH campaign. To address the possible influence of these events on study outcomes, our adjusted models included statistical controls for exposure to any anti-smoking campaigns in the last six months and to the SFO campaign. Despite these problems of timing and length, the biases are really conservative since we were able to detect campaign effects.

The potential non-comparability of the intervention cities and control cities such as tobacco industry activities and economic development may also have confounded associations between study variables. For example, Changsha is a mid-sized, major cigarette-producing city and Yinchuan is a small, economically less developed city while four intervention cities are among the top ten largest cities in China. Although our regression analyses controlled for measured differences between comparison groups, unmeasured variables may also explain the results. Furthermore, contamination is a potential internal validity threat since participants in the control cities could have been exposed to the campaign messages outside the city where they live or through satellite TV within their city of residence. Our assessment of campaign exposure within intervention cities helps overcome this limitation, but nevertheless may be limited by recall bias. Future campaign evaluations should better monitor and address contamination issues and better control for non-comparability of comparison groups (e.g., Olympics vs. non-Olympics cities in this study). More optimal evaluation timeframes could enhance

recall, which along with larger media buys and campaign duration may also overcome issues regarding small sample sizes for levels and types of exposure. In spite of these issues, our study is suggestive of campaign effects.

4.6 CONCLUSIONS

This study strengthens the evidence that mass media campaigns with graphic, emotionally evocative messages can raise awareness of smoking harms and change smokers' attitudes that are favorable to smoking-related norms. Despite the relatively low recall and short campaign duration, our study suggests that the GCGH campaign helped denormalize the socially engrained cigarette gifting behavior among Chinese urban smokers. The findings suggest that the Chinese government should consider development and dissemination of similar campaigns with similar message styles to address the tobacco epidemic in China. Those campaigns should be accompanied by rigorous evaluations to better evaluate the messages and media channels that are most effective at reaching and influencing people to adopt healthy behavior.

What the paper adds: The enormity of the tobacco epidemic in China calls for multiple approaches to increasing knowledge of the harms of cigarettes and changing societal norms about cigarettes. Mass media campaigns are one possible strategy, and such approaches are just beginning in China. This paper reports the results of the first large-scale population-based evaluation of a tobacco control mass media campaign conducted in China. The mass media campaign targeted the cultural tradition of gifting cigarettes at the same time as it aimed to increase knowledge and awareness of the harms of cigarette use. The longitudinal evaluation conducted among a population-based representative

sample demonstrates that as in many other countries, mass media campaigns in China can be effective in increasing knowledge and awareness of the harms of cigarettes. Such campaigns can also be effective in denormalizing common cultural practices that serve to maintain positive norms around tobacco products, such as giving cigarettes as gifts in China.

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Roswell Park Cancer Institute (Buffalo, New York, USA), the Cancer Council Victoria (Melbourne, Australia), and the Chinese Centers for Disease Control and Prevention (Beijing, China).

Table 4.1 Sample sociodemographics and smoking characteristics by comparison groups

Pre-Campaign Characteristics		Followed	Not followed	Intervention city	Control city	Recalled in Intervention city	Not recalled in Intervention city
		n=3709	n=949	n=2585	n=1124	n=335	n=2239
Age ^{ab}	Average	51.5	50.4	52.8	48.4	51.6	53.0
Sex	Male	94.7%	95.8%	94.7%	94.6%	94.3%	94.7%
Education ^{ab}	Low	12.2%	11.4%	11.3%	14.1%	9.9%	11.5%
	Medium	67.3%	63.0%	68.9%	63.8%	68.3%	68.9%
	High	20.5%	25.5%	19.8%	22.1%	21.9%	19.6%
Monthly household income ^{ab}	Low	16.0%	19.5%	14.1%	20.6%	13.2%	14.2%
	Medium	48.8%	49.4%	47.2%	52.4%	45.1%	47.4%
	High	35.2%	31.2%	38.8%	27.0%	41.7%	38.5%
Smoking status	Daily	94.3%	93.9%	94.2%	94.3%	95.0%	94.1%
	Non-daily	5.8%	6.1%	5.8%	5.7%	5.0%	5.9%
Heaviness of smoking index (HSI)	Average	2.33	2.34	2.35	2.27	2.33	2.35
Quit intention in the next 6 months ^c	Yes	15.5%	17.2%	15.6%	16.4%	22.0%	14.0%
Exposure to any antismoking campaign in the last 6 months at post-campaign ^c	Yes	68.2%	-	68.8%	67.9%	83.5%	65.6%

Note. Superscript letters denote significant difference at $p < 0.05$: ^a for followed up vs. not followed up; ^b for intervention city vs. control city; ^c for recall in intervention city vs. no recall in intervention city.

Table 4.2 Campaign exposure validation

Self-reported exposure to any anti-smoking campaign via corresponding channel in the last six months	Self-reported exposure to the Giving Cigarettes is Giving Harm campaign	
	TV OR (95% CI)	Poster OR (95% CI)
Pre- campaign	1.27 (0.82,1.99)	1.69* (1.09, 2.60)
Post- campaign	1.84 (0.72, 4.71)	2.84* (1.85, 4.36)

Note. Significant levels: *p<0.05

Table 4.3 Association between campaign exposure and campaign-targeted attitude about cigarette gifts

Attitude measure	Campaign exposure	n	%	Logistic regression ORs (95% CI)	
				Unadjusted	Adjusted
Disagreeing that cigarettes are good gifts for friends and family	Control cities	539	55.1	1	1
	Intervention cities	1393	59.8	1.22 (0.86, 1.73)	1.49 (1.06, 2.09)*
	Not recalled	1188	58.2	1	1
	Recalled the campaign	199	70.9	1.75 (1.28, 2.41)**	1.61 (1.17, 2.23)**
	Not recalled	1188	58.2	1	1
	Recalled 1 channel	125	74.6	2.09 (1.25, 3.50)**	2.00 (1.22, 3.27)**
	Recalled 2 and more channels	40	59.5	1.05 (0.43, 2.55)	0.83 (0.33, 2.06)
	Not recalled	1188	58.2	1	1
	Recalled TV	139	70.3	1.62 (1.02, 2.55)*	1.52 (0.94, 2.46)
	Recalled poster	33	62.4	0.84 (0.49, 1.42)	0.77 (0.43, 1.40)
Recalled mobile media	48	71.2	1.32 (0.67, 2.60)	1.16 (0.61, 2.21)	

Note. Significant levels for logistic regression: *p<0.05; **p<0.01; ***p<0.001. Adjusted for age group, sex, income, education, marital status, smoking status, intention to quit, exposure to general antismoking campaign, and exposure to the SFO campaign.

Table 4.4 Association between campaign exposure and campaign-targeted knowledge of smoking harms

Knowledge measure	Campaign exposure	Pre-campaign Mean	Post-campaign Mean	Diff	Poisson regression b (SE)	
					Unadjusted	Adjusted
Knowledge index of smoking harms including stroke, lung cancer in smokers, and cardiovascular disease	Control cities	1.37	1.63	0.26	1	1
	Intervention cities	1.38	1.67	0.28	0.013 (0.034)	0.038 (0.034)
	Not recalled	1.36	1.62	0.25	1	1
	Recalled the campaign	1.51	1.97	0.46	0.168 (0.043)***	0.135 (0.041)**
	Not recalled	1.36	1.62	0.25	1	1
	Recalled 1 channel	1.51	1.89	0.38	0.124 (0.046)*	0.087 (0.042)*
	Recalled 2 and more channels	1.45	2.24	0.79	0.301 (0.069)***	0.244 (0.065)**
	Not recalled	1.36	1.62	0.25	1	1
	Recalled TV	1.51	2.02	0.51	0.131 (0.044)**	0.104 (0.040)*
	Recalled poster	1.30	2.10	0.80	0.152 (0.074)*	0.092 (0.075)
Recalled mobile media	1.46	2.14	0.69	0.089 (0.071)	0.084 (0.073)	

Note. Significant levels for logistic regression: *p<0.05; **p<0.01; ***p<0.001. Adjusted for age group, sex, income, education, marital status, smoking status, intention to quit, exposure to general antismoking campaign, and exposure to the SFO campaign.

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CHAPTER 5

THE TRANSLATION OF EVIDENCE-BASED ANTI-SMOKING TELEVISION ADVERTISEMENTS IN THE CONTEXT OF A MIDDLE-INCOME COUNTRY: WHICH TYPE OF MESSAGE STRATEGIES WORK BEST¹¹

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5.1 ABSTRACT

5.1.1 Background

Research in high income countries suggest 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 (LMICs) is needed to inform campaign development in these countries.

5.1.2 Methods

Fifty-four male Taiwanese smokers, aged 18 to 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.

5.1.3 Results

Both quantitative and qualitative data indicated that the most effective ad was a testimonial that featured a graphic, emotional portrayal of personal suffering from the consequences of smoking. Visceral graphic advertisements were also rated as 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.

5.1.4 Conclusions

Study findings provide preliminary evidence that testimonials that involve graphic and emotionally evocative portrayals of smoking-attributed diseases may have the greatest potential to motivate Taiwanese smokers to quit smoking.

Word counts: 4690 words for body of text; 6322 words for the entire manuscript.

5.2 INTRODUCTION

Research on media interventions for tobacco control 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; Durkin et al., 2012; Dunlop 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 effective in affecting viewers' perceived effectiveness ratings and prompting thoughts of quitting (National Cancer Institute, 2008; Durkin et al., 2009, 2011; Davis et al., 2011; Wakefield et al., 2011; Dunlop et al., 2012). Evidence is more mixed on the effectiveness of ads that focus on tobacco industry manipulation of smokers, perhaps due to comprehension issues, potential issues with cultural translatability, the relatively distal relationship between industry attitudes and smoking behavior, or inadequate study designs (Thrasher and Bentley, 2006; National Cancer Institute, 2008; Malone et al., 2012). Stronger evidence has been found for the effectiveness of industry

manipulation messages in preventing smoking among youth (Farrelly et al., 2005, 2006; Thrasher et al., 2004, 2006; Thrasher and Jackson, 2006) and young adults (Hammond et al., 2006; Ling et al., 2007, 2009). However, the vast majority of tobacco control research on messaging strategies has been conducted in Western HICs (Malone et al., 2012; Durkin et al., 2012), and it is critical to determine which messaging strategies will 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 only recently begun to emerge (Murukutla et al., 2011; Thrasher et al., 2011, 2013; Wakefield et al., 2011; Mullin et al., 2013). For example, one message pre-testing study suggests that ads with graphic emotional appeals that portray serious consequences of smoking are perceived effective in the context of LMICs but ads with complex metaphors, medical terminology or personal testimonials have produced more inconsistent results (Wakefield et al., 2011). However, some specific messaging strategies, such as tobacco industry manipulation, remain understudied and should be considered within the socio-cultural context of LMICs (Malone et al., 2012). In LMICs with limited resources for tobacco control, costs and expertise required for pre-testing and producing media campaign materials may be prohibitive and use of existing evidence-based materials produced in other countries may be recommended (Wakefield et al., 2011). However, countries like Taiwan that have earmarked tobacco taxes to fund tobacco control activities may consider pre-testing alternative messaging strategies, including evidence-based campaign materials from other countries, to maximize campaign effectiveness.

5.2.1 The Taiwanese context

The 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 (Chen et al., 2004); nevertheless, this prevalence is still 1.6 times higher than in Western HICs (Taiwan Bureau of Health Promotion, 2012). The Taiwan Department of Health 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; Taiwan Bureau of Health Promotion, 2005); however, these campaigns usually lack emotionally evocative, graphic messaging strategies. They usually used positive or humorous messages, or less graphic and emotionally evocative messages to communicate the serious consequence of smoking with smokers and general public. They often used celebrity endorsement to convey and enhance anti-smoking messages, rather than personal testimonials from ordinary people. Furthermore, insufficient evaluation of campaigns has not allowed either the determination of their effects or the use of such evidence to inform future campaign strategies (Taiwan Bureau of Health Promotion, 2005). The studies that have examined the relative effectiveness of Taiwanese anti-smoking television ads with differing messaging strategies are limited. These studies did not examine ads that varied significantly in messaging content and style, and the ads they evaluated lacked strong graphic messages. One cross-sectional study showed that cessation services and smoke-free restaurant ads had higher recall rates than other messaging strategies (i.e., tobacco industry denormalization and animated-cartoon simulation of smoking harms) (Chang, 2004). However, this study did not evaluate the

impact of specific ads on smokers' smoking-related intentions and behaviors. Focus group results from another study revealed that a testimonial ad featuring secondhand smoking harms may be more likely to influence nonsmokers to persuade their relatives and friends who smoked to quit smoking and to influence smokers to avoid smoking in the presence of nonsmokers; nevertheless, neither of the two ads were thought to be likely to prompt smokers to quit smoking (Hsu and Wang, 2007).

The aim of the current study is to assess which smoking cessation ad strategies are most effective among Taiwanese smokers as indicated by comprehension, perceived effectiveness, and unprompted recall. We hypothesize that ads with strong graphic imagery or highly emotional testimonials are more likely to be perceived as effective than ads lacking these elements. The results aim to inform decisions about which messaging strategies to use in this middle-income Asian country and whether the most effective ads appear any differently from those found to be effective in other countries.

5.3 METHODS

5.3.1 Study Design

This study used a mixed qualitative and quantitative data collection method that includes an individual ad rating survey, focus groups and a follow-up telephone survey. Prior to participating in the focus groups, smokers viewed and individually rated eight different anti-smoking television ads, after which they participated in a semi-structured 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 (Terry-McElrath et al., 2005).

5.3.2 Study sample

The study took place in a southern city in Taiwan, where male smoking prevalence is somewhat lower than the national average (28.0% vs. 33.5%) (Taiwan Bureau of Health Promotion, 2013). People were eligible to participate if they were male; aged 18 to 34 years; had smoked at least 100 cigarettes in their lifetime; and had smoked at least once in the previous week. This group was selected for study because substantially more males than females smoke in Taiwan (33.5% vs. 4.4%) and because smoking prevalence reaches its peak in this age group, when young adult male smokers transition to become established smokers. Furthermore, prior formative research in ten LMICs found that male smokers generally responded differently to anti-smoking television ads compared to female smokers, for example, males were found to rate ads lower than females (Wakefield, 2011). Participants were recruited by flyers posted on and/or distributed through social media, internet discussion boards, and on bulletin boards in the public transportation system, convenience stores, businesses, and public service agencies.

Data were collected between May 2012 and August 2012. Participants were pre-screened 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 six 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.

5.3.3 Ad categorizations and selection

Ads were purposively selected based on contrasting ad content and style including: 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, using definitions provided by the researchers and previous studies (National Cancer Institute, 2008; Durkin et al., 2009, 2011; Wakefield et al., 2011). All of the ads were 30 seconds in duration (see characteristics and brief description of the ads in Table 5.1). Three ads had been produced and broadcast in Taiwan (*Duo*, *COPD*, and *Smile*). The other five ads were adapted from ads produced and shown to be effective in their countries of origin; these ads provided Chinese textual overlay. Two of these five ads maintained the English-language speech of the original version (*Oral cancer* and *Candle*) to present testimonials' original voice and emotions. Two ads were dubbed into Chinese, one of which had already been broadcast in Taiwan (*Sponge*). One ad was not involved in dubbing because it did not contain audio (*1200 dead*).

5.3.4 Procedure and measurements

The initial questionnaire collected information about participants' socio-demographic characteristics, daily cigarette consumption, and intention to quit in the next six months. Participants were then shown an ad two consecutive times, after which they were asked to rate the ad. To minimize any potential effects of ad viewing order, groups viewed the 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 with 'strongly disagree' coded as 1 and

‘strongly agree’ coded as 5 (Wakefield et al., 2011). These questions 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’). These measures reflect key constructs in the central processing route from message exposure to persuasion, according to the Elaboration Likelihood Model (ELM) (Petty and Cacioppo, 1986). Scores for each item were assessed individually, except for the perceived effectiveness (PE) scale, which included five items that were averaged together with good internal consistency (Cronbach alpha ranges from 0.79 to 0.87 across ads).

After all ads were rated individually, participants were asked to select and rank the three ads that made them feel most like trying to quit smoking, followed by ranking of the three ads that least motivated them to quit. Participants were then asked to compare five pairs of ads that contrast with each other on particular ad characteristics of interest.

After these individual evaluations, focus group discussions were conducted by a moderator who used a semi-structured interview guide to facilitate and structure participant discussions. Nine questions with probes were used to explore participant comprehension, acceptability, and perceived effectiveness of each ad individually as well as the relative effectiveness of paired 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 ads they could recall from the focus group session.

5.3.5 Data analysis

Quantitative analysis of ad ratings was performed using STATA, version 11 for Windows (StatCrop, College Station, TX, USA). Means were used to describe ratings for each ad. Proportions were used to describe and identify the most and least effective ads, as well as ads recalled by participants at follow up. A two-way ANOVA omnibus assessment of differences in ratings by ads was conducted and accounted for the random effect of an individual's response and the fixed effect of ads. When ANOVA results indicated significance in ratings among ads, post-hoc paired t-tests were then conducted to test all pairwise differences among ratings for significance (see Table 5.3) (Salkind, 2010). Analyses were re-run after stratification of groups by educational attainment and quit intention (See Table L.3). Independent sample t-tests were conducted to examine participants' mean PE ratings of all ads for groups by educational attainment and quit intention.

Qualitative analysis of focus group discussions was undertaken using NVivo, version 10 for Windows (QSR International, Victoria, Australia). Focus group transcripts were coded and analyzed following a sequence of five interrelated 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 (i.e., patterned responses or meanings that capture essential points within the data set related to

research questions; Braun & Clarke, 2006) from focus group discussions were examined and compared with the quantitative individual data to determine the consistency of results.

5.4 RESULTS

5.4.1 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 of respondents had tried to quit smoking in the last 12 months, and about half intended to quit in the next six months (Table 5.2). As shown in Table 5.3, some participants reported that they had seen some of the ads prior to the study. Over two-thirds reported having seen *Sponge*, 44% had seen *COPD*, and 35% had seen *Duo*, whereas less than 5% reported seeing the other five ads.

5.4.2 Quantitative findings: Ad ratings and recall

A two-way ANOVA was used to test the difference in PE scores among eight ads, showing that PE scores differed significantly across the eight ads ($F(7, 371) = 22.23$, $p < 0.001$). Post hoc paired t-tests showed that the *Oral cancer* ad had the highest PE score, significantly outperforming the other seven ads ($PE_{\text{oral cancer}} = 4.0$ vs. $PE_{\text{artery}} = 3.7$, $p < .05$; See Table 5.3). *Artery*, *Candle*, and *Sponge* ads ($PE_{\text{artery}} = 3.7$, $PE_{\text{candle}} = 3.7$, $PE_{\text{sponge}} = 3.7$) were rated in the next effective group and received similar PE scores, which were significantly higher than the *COPD*, *Duo*, *1200 dead*, and *Smile* ads ($PE_{\text{copd}} = 3.4$, $PE_{\text{duo}} = 3.4$, $PE_{\text{1200 dead}} = 3.1$, $PE_{\text{smile}} = 2.9$, $p < .05$). The *Smile* ad was perceived to be the least effective ads and received significantly lower PE scores ($p < .05$) than any other ads

except the *1200 dead* ad. Similar relative PE ratings across eight ads were found after the stratification of groups by educational attainment and quit intention, with *Oral cancer* and *Smile* ads being rated as the most and least effective ads respectively. The ad with the highest PE score, *Oral cancer*, also received the highest ratings on comprehension, credibility, emotion, and relevance, while the ad with the lowest PE score, *Smile*, received the lowest ratings on most of the other measures. Ranking data were consistent with rating results: *Oral cancer*, *Candle*, and *Artery* were ranked as the best three ads while *Smile*, *1200 dead* and *Duo* were the worst ads.

Smokers with a prior quit intention appeared to give higher ratings than their counterparts, but the difference was not statistically significant ($PE_{\text{mean of all ads}} = 3.6$ vs. 3.4 , $p=.18$). Smokers who had greater than high school education gave similar ratings compared to those with a high school education or less ($PE_{\text{mean of all ads}} = 3.5$ vs. 3.5 , $p=.96$).

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. Among those who reported their first recalled ad as *Candle* (35%), *Oral cancer* (29%), or *Sponge* (18%), over 94% thought the ad was effective, with less than one third saying that they tried to quit because of the ad they recalled. Among those who reported the recall of second and third ads (*Candle*, *Oral cancer*, or *Artery*), fewer participants thought the ad was effective (83% to 92%) and reported they tried to quit because of the ad they recalled (less than 25%).

5.4.3 Qualitative findings: focus group discussions

Qualitative responses to ads were basically consistent with overall quantitative ratings and provided rich and in-depth context to the ratings. Primary themes or constructs in relation to research questions are discussed below: emotional arousal, relevance, perceived severity and susceptibility, comprehension and credibility.

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 participant provided a representative response to the *Oral cancer* ad: “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*, *COPD*), most smokers described having no or weaker emotional responses than for the other ads. A representative response about the *Smile* ad: “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 emotionally, 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. "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 perceived susceptibility to smoking-attributed diseases depicted in ads by comparing their relatively younger age to the age of characters in ads. It is worth noting that despite the low rate of smoking 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 other messaging styles 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.”

Perceived severity and susceptibility

The graphic portrayal of diseased body parts and human suffering from smoking-related disease had a strong emotional impact on smokers. Smokers’ emotional responses to ads were related to their perceptions of the severity of the harms depicted in the ads, as well as their susceptibility to these harms. 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.

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*). These comprehension issues clearly impeded 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 (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.

Credibility

Smokers usually doubted the credibility of ads that portrayed unfamiliar medical conditions. For example, smokers questioned the color and amount of tar squeezed from the “sponge” lung, and therefore concluded that the ad exaggerated the real quantity of tar that can be accumulated in lungs. The visceral image of a diseased aorta in *Artery* that smokers have not seen before made them question its authenticity, thus causing credibility and acceptance issues about the ad. “I think it (a section of artery) looks like an intestine. I think fat squeezed out of this thing has more to do with eating than smoking.” (*Artery*) Some smokers also raised doubts about the linkage between specific disease outcomes and smoking. Those smokers who regarded the *Oral cancer* ad as ineffective questioned the credibility of this ad because they thought oral cancer or diseases are most likely caused by betel quid chewing rather than smoking alone (Betel quid chewing is prevalent in Taiwan and make its users’ mouth and teeth stained with betel quid juice).

5.5 DISCUSSION

This study found consistent results across individual ad ratings, focus group discussions, and ad recall assessments, suggesting that ads with a combination of emotionally evocative personal testimonials that contain graphic imagery were 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). According to ELM, perceived relevance of the message is one of the key determinants of motivation to process health information and enhance behavioral change (Petty and Cacioppo, 1986). Health communication literature demonstrated that enhancing message relevance can produce greater desirable behavior change (Kreuter & Wray, 2003; Rimer & Kreuter, 2006). Prior formative research found that male smokers had more variable responses to testimonials when they portrayed women or mothers (Wakefield et al., 2012); however, our study found that male smokers had strong 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. For example, one recent study in India found that personal testimonials featuring local victims are highly effective (Mullin et al., 2013).

Our results indicate 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 are exposed to the ads. This finding is consistent with other research that finds that the types of ad that are effective in promoting smoking cessation (e.g., highly emotional graphic imagery and testimonials) are effective across different sociodemographic groups (National Cancer Institute, 2008; Durkin et al., 2009; Durkin et al., 2012). Nevertheless, we found that among the sociodemographic characteristics of people featured in ads, age appeared more influential to smokers' perceptions of the relevance of the ads 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 (e.g., the Pam Laffin campaign by Massachusetts Department of Public Health) have proven effective among young viewers perhaps because of their comparable ages (Schar et al., 2006). In addition, our results suggest that ads should portray ordinary smoking victims to avoid viewers' counterarguments against the message 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 bête nut chewing) portrayed in the 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). We found that participants had some difficulties understanding complex terminology, the lack of direct, explicit linkage between smoking and harms, and the use of some metaphors to illustrate harms. These difficulties were

found for some ads already aired in Taiwan, underscoring the need to pre-testing ads. Linking media campaign content with that contained in health warning labels may also enhance message comprehension, perhaps by providing supporting information and animating the otherwise static warning label content (Brennan et al., 2011; Thrasher et al., 2013).

Credibility appears to affect smokers' acceptance of the ads, and in turn, the perceived effectiveness of ads. In particular, smokers tended to question more unfamiliar body parts, tissues (e.g., artery), or medical conditions, which seemed to result in their challenging the facts about serious harms of smoking. The causal linkage between depicted diseases/conditions and smoking may need to be explicit and include statistical evidence. Messages should also avoid mentioning other risk factors associated with smoking-attributed diseases (e.g., betel nut chewing and drinking in *Duo*), which may obscure smoking's linkage to diseases. One potential way to enhance the credibility and persuasion of messages is to use a credible health professional, like the cancer surgeon featured in a smokeless tobacco control campaign in India, who presented local victims and statistics (Murukutla et al, 2011).

The novel approach of targeting the tobacco industry was viewed as unique, but most participants felt it was irrelevant to them. The ad focused on the predatory practices of the tobacco industry and was perceived as a protest against the tobacco industry rather than speaking to smokers and motivating them to quit. The adaption 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 & Bentley, 2006), particularly those countries with state-owned monopoly since anti-tobacco industry could be interpreted as an act “against the government” (Yuxi, 2012). 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 due to small sample size was further magnified by multiple tests, including analysis of participant responses to ads by educational attainment and quit intention. 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 (Lavrakas, 2008).

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.

Forth, the study results may have been confounded by novelty effects since some participants had seen the ads in Taiwanese campaigns and some of the 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. Finally, those who participated in the study do not represent the broader

population of 18 to 34 year old smokers, so the results may not generalize to Southern Taiwan or beyond.

In conclusion, the study findings provide preliminary evidence that personal testimonials that graphically and emotionally portray victims' smoking-attributed diseases may have the greatest potential to motivate smokers to think about quitting smoking because of the strong, negative emotions they provoke and 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, including through examination of behavioral outcomes. 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.

Table 5.1 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, warn people about the danger of smoking, and persuade people to quit before it's too late.
	Duo (TW)	No	Low	Two well-known 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 well-know 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	An actress played as an oral cancer victim speaks to the camera about the fact that smoking causes all cancers in an emotionally evocative way. The actress' cancerous mouth is zoomed out from a graphic image of oral cancer on the cigarette warning label.
Graphic image and Scientific evidence	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 U.S. 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 disease.

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. Ads can be viewed upon request.

Table 5.2 Sample characteristics (n=54)

Characteristics	Number	Mean/Percent
Age (18-34 years)	54	25.0
Education		
High school education or less	21	39%
More than high school education	33	61%
Smoke status		
Smoke less than 1 cig per day	5	9%
Smoke 1-10 cigs per day	25	46%
Smoke more than 10 cigs per day	24	45%
Thinking about quitting in the next 6 months		
Yes	26	48%
No	28	52%
Tried to quit in the last 12 months		
Yes	26	48%
No	28	52%

Table 5.3 Ad ratings on perceived effectiveness and other individual measures

Ad ratings and exposure	Oral Cancer	Artery	Candle	Sponge	COPD	Duo	1200 Dead	Smile
Percent / Mean (sd)								
Prior exposure	0.0%	3.7%	0.0%	68.5%	44.4%	35.2%	0.0%	1.9%
Perceived Effectiveness Scale	4.0 ^a (0.7)	3.7 ^b (0.7)	3.7 ^b (0.7)	3.7 ^b (0.6)	3.4 ^c (0.8)	3.4 ^c (0.7)	3.1 ^d (0.9)	2.9 ^e (0.8)
Easy to understand	4.5 ^a (0.7)	4.2 ^b (0.7)	4.1 ^{bc} (0.9)	4.5 ^a (0.5)	4.1 ^{bc} (0.9)	4.3 ^{ab} (0.7)	3.9 ^c (1.0)	4.0 ^c (0.9)
Teaches me something new	3.7 ^{bc} (0.9)	3.9 ^a (0.9)	3.1 ^e (1.0)	3.7 ^{bcd} (0.8)	3.8 ^{ab} (1.1)	3.4 ^{cd} (0.9)	3.4 ^{de} (1.2)	2.6 ^f (1.0)
Believable	4.1 ^a (0.9)	3.7 ^{cd} (0.8)	3.9 ^{abc} (0.9)	3.8 ^{bcd} (1.0)	4.0 ^{ab} (0.8)	4.0 ^{ab} (0.9)	3.5 ^d (1.0)	3.2 ^e (1.0)
Make me feel uncomfortable	4.4 ^a (0.8)	3.6 ^c (0.9)	4.0 ^b (0.8)	3.2 ^d (1.1)	2.4 ^e (1.1)	2.5 ^e (1.0)	2.4 ^e (0.9)	2.3 ^e (0.9)
Speaks to people like me	3.5 ^a (1.0)	3.4 ^{bc} (0.9)	3.5 ^{ab} (1.0)	3.4 ^{ab} (0.9)	3.1 ^{bc} (1.0)	2.9 ^{bc} (0.9)	3.2 ^c (1.0)	2.9 ^d (1.0)

Note. 1. *Cronbach alpha ranges from 0.79 to 0.87 among the 8 ads. 2. Superscript letters denote significant difference at $p < .05$ for post-hoc paired t-tests. Ads with the same superscript letter are not significantly different from another.

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CHAPTER 6

CONCLUSIONS AND IMPLICATIONS

6.1 OVERALL CONCLUSIONS

The study findings strengthen the evidence that mass media campaigns with graphic, emotionally evocative messages that are conveyed in culturally or personally relevant ways can raise awareness of smoking harms, change smokers' attitudes that are favorable to smoking-related norms, as well as motivate smokers to think about quitting smoking in Asian LMICs. The GCGH campaign helped denormalize the socially engrained cigarette gifting behavior among Chinese urban smokers despite the relatively low recall and short campaign duration. Anti-smoking television ads using personal testimonials that graphically and emotionally portray victims' smoking-attributed diseases may have the greatest potential to motivate Taiwanese smokers to think about quitting smoking.

6.2 DISCUSSION

The campaign evaluation study (i.e., Study One) suggests that that recall of the GCGH campaign was associated with greater disapproval of gifting cigarettes and with greater increases in knowledge of smoking-related harms. This suggests that the campaign's novel strategy of linking cigarette gifting to graphic images of diseased organs and symbols of death may have begun to reduce the social acceptability of giving cigarettes as gifts, and may have the greater impact when the campaign is implemented

on a larger scale to produce higher recall rate in the future. This result is consistent with previous studies on effective tobacco control messaging strategies (National Cancer Institute, 2008; urkin et al., 2009, 2011; Davis, et al., 2011; Wakefield et al., 2011; Dunlop et al., 2012) and adaptation of evidence-based messages in sociocultural context (Wakefield et al., 2011; Gould et al., 2012).

The focus group message testing study (i.e., Study Two) reveals that personal testimonials with graphic imagery appear to evoke strong negative emotional arousal and are perceived as personally relevant and effective. Prior studies have found that this type of ad increases perceptions of the severity of and susceptibility to smoking-related diseases, which, in turn, promotes quitting behavior (Dunlop et al., 2008; Durkin et al., 2009). Pictorial warning labels studies have also found that the combination of graphic imagery with imagery of human suffering produces a stronger effect than either of these by itself (Hammond et al., 2012). Prior formative research found that male smokers had more variable responses to testimonials when they portrayed women or mothers (Wakefield et al., 2012); however, this study found that male smokers had strong reactions to female characters featured in testimonials, perhaps because they were not portrayed as mothers or occupying any other specific social role, thereby reducing issues with relevance. Furthermore, the results suggest that the ability of ads to evoke strong emotional responses may be more important than the demographic similarity of the people featured in ads and the smokers who are exposed to the ads. This finding is consistent with other research suggesting that the types of ad that perform well (e.g., highly emotional graphic imagery and testimonials) do so across different sociodemographic population groups (National Cancer Institute, 2008; Durkin et al., 2009;

Durkin et al., 2012). Nevertheless this study found that among the sociodemographic characteristics of people featured in ads, age appeared more influential on smokers' perceptions of the relevance of the ads than other characteristics, such as sex, race, or nationality.

6.3 LIMITATIONS

Study One has several limitations. The sample in Study One was designed to be representative of a selection of urban cities in China; therefore results may not generalize to the rural Chinese population or to other urban cities not included in the sample. The under-sampling of smokers aged 18-24 is probably due to absence at the time of interview.

Given loss to followup (n=949), the results from our study may be limited by attrition bias, one of the main threats to the external and internal validity of longitudinal cohort studies (Lavrakas, 2008; Schutt, 2012). Those lost to follow-up tended to be younger, have higher educational attainment, and have lower household income. This bias may weaken generalizability of our results to these subpopulations. Furthermore, internal validity may be compromised because study drop-outs may respond differently to campaigns than participants who were successfully followed up. For example, those who were successfully followed up had relatively lower educational attainment, and studies from high-income countries with long histories of tobacco control have found that low SES smokers have stronger responses to graphic, evocative cessation campaigns than smokers from high SES groups (Durkin et al., 2009, 2011; Wakefield, 2011). Hence, we may have overestimated campaign effects due to greater retention of less-well educated

smokers. However, greater campaign effects among lower SES smokers may occur only in societies where smoking has been concentrated in low SES groups, which is not the case in China. Furthermore, when examining the SES indicator of household income, higher income smokers were more likely to be followed up. Hence, our differential retention of smokers with lower education but higher income makes it difficult to predict the direction of the bias.

The pre-and-post evaluation surveys were not conducted immediately before and after the GCGH campaign because this study utilized surveys from the ITC China Project, which was designed to measure the effectiveness of national-level tobacco control policies (Wu et al., 2010), rather than the campaign alone. The lengthy period between pre-and-post campaign surveys may have introduced some biases. First, the pre-campaign survey was conducted one year before the campaign was broadcast, which is not optimal given that changes may have taken place between pre-campaign survey and campaign onset. Second, the short duration of the campaign and the lengthy time from the campaign's end to post-campaign survey (three to seven months) may have missed the maximal impact of the campaign as campaign effects decay (Durkin et al., 2012). Studies show that the beneficial effect of mass media campaigns appears only within two to three months after exposure (Wakefield et al., 2008, 2011). Indeed, this likely helps to explain the low campaign recall rate and the relatively small or non-existent campaign effects. Third, this study is subject to internal validity threats such as history effects due to the lengthy evaluation timeframe. To address the possible influence of these events on study outcomes, our adjusted models included statistical controls for exposure to any anti-smoking campaigns in the last six months and to the SFO campaign which included mass

media campaigns promoting smoke-free environments took place in three of intervention cities, Beijing, Shanghai, and Shenyang, in August 2008. Despite these problems of timing and length, the biases are really conservative since we were able to detect campaign effects.

The potential non-comparability of the intervention cities and control cities such as tobacco industry activities and economic development may also have confounded associations between study variables. Although our regression analyses controlled for measured differences between comparison groups, unmeasured variables may also explain the results. For example, Changsha, a major base for Chinese tobacco industry, had significantly lower percentage of participants who thought that Chinese society disapproves smoking and cigarette gifts than any other five cities. Furthermore, contamination is a potential internal validity threat since participants in the control cities could have been exposed to the campaign messages outside the city where they live or through satellite TV within their city of residence. Our assessment of campaign exposure within intervention cities helps overcome this limitation, but nevertheless may be limited by recall bias due to measurements of past events (Lavrakas, 2008). Participants had variations in their ability to remember their past experiences or events; thus recall bias may result in inaccurate or misleading results. In spite of these issues, our study is suggestive of campaign effects.

The Study Two has several limitations, including some that stem from the nature of focus group research. Participants in the study do not represent the broader population of 18 to 34 year old smokers, so the results may not generalize to Southern Taiwan or beyond. The sample size was small and may not catch the full range of variability in

participants' responses to the ads. The lack of power to detect statistically significant differences due to small sample size was further magnified with multiple testing and analyzing participant responses to ads by educational attainment and quit intention. Although educational attainment strata and quit intention strata revealed similar patterns of quantitative responses, this may be a result of lack of statistical power to test responses to different ads across participant types. However, the limited meaningfulness of the quantitative results can be complemented and triangulated by qualitative results, uncovering and elaborating the underlying meaning of quantitative results. Participants self-selected into the study. Their propensity for participating in the study may be correlated with the research topic, causing a self-selection bias in the resulting data (Lavrakas, 2008). One participant expressed his enthusiasm about the study because he had strong opinions on smoking cessation ads broadcast in Taiwan.

Ad ratings involved self-reported responses, which may be subject to bias, and they did so under conditions of forced exposure, which is different from naturalistic campaign exposure. Actual effects on participants' behaviors or attitudes may be quite different. However, other studies have shown how the perceived effectiveness of ads predicts actual changes in message-targeted attitudes and behaviors (Dillard et al., 2007; Brennan et al., 2013; Bigsby et al., 2013). Furthermore, our follow-up phone survey of ad recall provided results that were consistent with those from the prior stage.

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 were not hold constant for comparisons may as well explain 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 by controlling these characteristics more closely and manipulating one particular characteristics of interest to examine the relative effectiveness of the ads. According to the ELM, an individual with high motivation and ability is more likely to take the central route to process message content (Petty and Cacioppo, 1986). Therefore, when an individual who is less motivated (i.e., without quit intention) takes the peripheral route to process message content, peripheral cues (i.e., ad characteristics, demographic characteristics of people in ads) become more important in determining the persuasion of messages.

The adaption of the five foreign ads was not entirely consistent in terms of dubbing efforts, which may have impacted comprehension of ads. 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. 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 the ad performance that was proven effective 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. The study results also may have been confounded by novelty effects, since some participants had

seen the Taiwanese ads and even some of the foreign ads, whereas other ads were novel. The less novel nature of some ads may help explain their lower reported impact than the other ads which participants had not previously seen. However, the ad that most recalled having seen (i.e., Sponge) was also amongst the most well-evaluated ads.

6.4 IMPLICATIONS

The findings from Study One suggest that the Chinese government should consider development and dissemination of campaigns with graphic, emotionally evocative message styles to address the tobacco epidemic within the sociocultural context of China. Although message contents should be developed to be country-specific, the characteristics and general features of ads appear to work across both HICs and LMICs from a range of cultural contexts. Monitoring and evaluation of campaigns is a critical element of best-practice tobacco control mass media campaigns. Therefore, the campaigns should be accompanied by rigorous evaluations to better understand the messages and media channels that are most effective at reaching and influencing people to adopt healthy behavior.

The findings from Study Two provide preliminary evidence that personal testimonials that graphically and emotionally portray victims' smoking-attributed diseases may have the greatest potential to motivate smokers to think about quitting smoking precisely because of the strong negative emotional arousal and perceived personal relevance. Testimonials featuring younger smoker victims may appeal to younger smokers because youth appeared less likely to view themselves as susceptible to smoking-attributed diseases illustrated by people who are visibly older than them.

Testimonial ads should portray ordinary smoker victims to avoid viewers' counterarguments about the unique social role (e.g., mothers), atypical lifestyle (e.g., entertainers) or other risky health behaviors (e.g., drinking and bête nut chewing).

Comprehension difficulties result from complex terminology, lack of direct, explicit linkage between smoking and the harm, and the use of some metaphors to illustrate harms, underscoring the need for pre-testing. Synergetic efforts may be generated by linking media campaign ads with other messaging, such as health warning labels, innovative websites, and social and digital media. These strategies may enhance the comprehensibility as well as effectiveness of the tobacco control media campaigns (Brennan et al., 2011; Shannon et al., 2013).

The adaption of the tobacco industry denormalization messaging strategy for use outside of countries where this strategy has been effective should be carefully examined. 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), particularly those countries with state-owned monopoly since anti-tobacco industry could be interpreted as an act “against the government” (Yuxi, 2012).

Taiwanese study findings have several implications for campaign development in China. First, personal testimonial style television ads that graphically and emotionally portray victims' smoking-attributed diseases may be more effective than other ad styles if the aim is to change knowledge and attitudes about smoking-related harms and norms, as well as to prompt thoughts about quitting smoking among Chinese smokers. Tobacco

industry denormalization style ads may not be readily understood and perceived as relevant, but this ad type may also be considered offensive or even irrelevant in the socio-cultural and political-economic context of China. As a state-owned monopoly and the world's largest manufacturer of tobacco products, the tobacco industry in China has substantial economic and political influence for derailing tobacco control policies. Therefore, tobacco industry denormalization strategies are likely to face resistance from both government and industry, as well as from people who benefit from the industry through ubiquitous jobs (e.g., retailer who sells cigarettes) and industry-sponsored charity projects (Pfau, Haigh, Sims, & Wigley, 2008). More research about public perceptions of tobacco industry and message pre-testing on this tobacco industry denormalization strategy are needed to determine whether this strategy works well in the Chinese context and whether it might be effectively adapted to the Chinese context. Third, although television has been suggested to be the most effective, powerful medium for reaching smokers (National Cancer Institute, 2008; Durkin et al., 2012), comprehension issues still rise partly due to the short duration of typical ads (30 seconds in length). One way to enhance comprehension is to invite ad viewers to visit campaign websites and call toll-free phone lines (e.g., quitlines) to seek and clarify information about campaign messages, which is often done in HICs (CDC, 2013). Linking media campaign content with other messaging, such as health warning labels, innovative websites, and social and digital media may enhance message comprehension by providing information to support smoking cessation and prevention, as well as to increase exposure to campaign messages.

In sum, the findings from both studies have provided implications for best practices on messaging strategies and dissemination for tobacco control mass media campaigns.

Mass media campaigns with graphic, emotionally evocative messages that are conveyed in culturally or personally relevant ways appear promising for raising smokers' awareness of smoking-related harms, change smokers' attitudes that are favorable to smoking-related norms, and potentially motivate smokers to quit smoking in Asian LMICs. In our studies, highly emotional, graphic ads were consistently perceived as effective in motivating Asian smokers to quit smoking. Due to costs and expertise required for pre-testing and producing media campaign materials, LMICs with limited resources for tobacco control should consider using existing evidence-based materials produced in other countries through the translation and adaptation of ads (Wakefield et al., 2011). However, evidence has recently showed that locally-produced ads that feature testimonials from people with typical sociodemographics can be highly effective, perhaps by optimizing the personal relevance of ad characteristics (Mullin et al., 2013). Therefore, when adequate resources are available for campaign development and formative research, it is recommended to produce ads that feature personal testimonials from the victims of smoking-related harms, graphic portrayal of tobacco-attributable harms, and identifiable socio-cultural contexts and characteristics of people portrayed to elicit emotions and relevance for maximizing the effectiveness of tobacco control messages.

6.5 FUTURE RESEARCH

Given the methodological challenges, the limitations and implications from both studies highlight the need for more research in the area of tobacco control mass media campaigns in LMICs, in order to provide robust evidence of effective, socio-culturally-relevant messaging strategies and efficient translation of evidence-based persuasive

messages. Future research should consider using rigorous study designs that could yield valid conclusions about campaign effectiveness.

6.5.1 Study One

The study design issues that Study One faced are inherent in quasi-experimental evaluation studies, including differences between intervention and control groups, whether comparing intervention and control cities or comparing smokers in the intervention cities who did and did not recall the campaign. For Study One, the non-comparability of the intervention cities and control cities should be addressed in future research by matching cities at baseline according to demographic characteristics, known or hypothesized correlates of smoking behaviors, tobacco industry activities, and economic development. Intervention and control groups would ideally be as similar or comparable as possible to one another so that baseline differences between intervention and control groups could be ruled out as alternative explanations for campaign impact (Schar, et al., 2006). To avoid or minimize contamination of control cities, campaign evaluation research should be designed in the phase of campaign development and implementation to assure treatment under evaluation, i.e., campaign activities or messages, to be delivered to intervention and control groups as intended in the evaluation research. Time series studies could be conducted, as well, where the intensity of media buys is varied over time within the same populations. This approach would likely work best when tied to behavioral outcomes, such as the volume of calls to quitlines (Wakefield et al., 2011).

Since the low recall rate of the GCGH campaign probably resulted from lengthy time between the end of the campaign and the follow-up survey, future research should optimize the timing of surveys that is able to detect campaign effects after campaigns end (Durkin et al., 2012). Pre-campaign surveys should be conducted immediately before campaign launch and post-campaign surveys should be conducted immediately after campaign's end to assess the immediate impact of the campaign, and three and six months after campaign's end to assess the extent of campaign decay. To supplement self-reported recall data, future research is recommended to analyze media buy information to assess the intensity of campaign messages. As for the implications of media campaign intensity in practice, future campaign implementation should sustain the optimal levels for media buys, a level of at least 1200 GRPs per quarter for a total of 4800 GPRs per year (Wakefield et al., 2008; Durkin et al., 2012).

Future research should also improve measurement of key behavioral outcomes and psychosocial mediators that explain these outcomes. For example, the GCGH campaign's primary message involved cigarette gifting behavior, and questions should have assessed the prevalence and incidence of giving and receiving cigarettes as gifts. Assessment of attitudes should also include evaluation of giving and receiving cigarettes as gifts in a variety of contexts, as attitudes towards giving and receiving cigarettes as gifts may vary across situations.

Other unmeasured variables that may be important to understand associations between campaign exposure and psychosocial and behavioral outcomes should also include those key constructs, such as negative emotion arousal (i.e., fear) and perceived efficacy in Extended Parallel Process Model (EPPM) (Witte, 1992, 1994), and message

relevance in the central processing route from message exposure to persuasion in ELM (Petty and Cacioppo, 1986). Perceived efficacy is critical to how an individual evaluates harm and includes two dimensions: perceived self-efficacy (i.e., an individual's beliefs about one's ability to achieve the intended effects) and perceived response efficacy (i.e., one's beliefs about whether the recommended response is effective in eliminating the harms) (Bandura, 1986; Witte and Allen, 2000). Studies show that messages with strong fear appeals are more persuasive than weak fear appeals, and produce the greatest levels of behavioral change when combining information that enhance perceived efficacy (Witte and Allen, 2000). Health communication literature demonstrates that enhancing message relevance can produce greater desirable behavior change (Kreuter & Wray, 2003; Rimer & Kreuter, 2006). Future research should measure these constructs to determine their importance in understanding how and with whom novel campaigns like GCGH work.

6.5.2 Study Two

Focus group research is subject to limitations inherent in qualitative methodologies and the unique features of focus group methods (Uline et al., 2005). Study design issues pertaining to Study Two include the selection and stratification of samples and the selection of ad style and content. Due to limitations on research resources and time allocation, the sample size in Study Two was small, included only males, and focus groups were not completely stratified by educational attainment and quit intention. Participants were assigned to focus group mostly by educational attainment (9 out of 10 groups: 5 groups including participants with high education level, 4 groups including participants with low education level) but partially by quit intention (3 out of 10 groups: 3

groups including participants with quit intention). Future research should focus more on recruiting more participants, including females (due to increasing smoking prevalence from 3.8% in 1990 to 4.4% in 2011; Taiwan Bureau of Health Promotion, 2012), and assigning participants to focus groups by educational attainment, quit intention, and sex evenly (8-10 people per groups, at least two groups for each level of stratification).

Increasing sample size would aim to (1) capture the full range of potential participant responses for achieving data saturation in key groups, and (2) increase statistical power of detecting statistically significant differences within and across participants and groups. Stratification of groups along key audience characteristics (i.e., educational attainment and quit intention) aims to produce relatively homogeneous focus groups (Patton, 2002), to enhance the validity of comparisons of participant responses to different ad styles and contents.

For anti-smoking message pretesting, experimental approaches may allow for tighter control over ad characteristics and their effects. For example, ads that control for all characteristics except for the visible identity (e.g., sex, race) of the protagonist may be best assessed through an experimental design that randomly allocates people to view different ad conditions. Similarly, narrative style (e.g., testimonial) and ad content (e.g., fear arousal, self-efficacy to quit) could be experimentally manipulated and assessed. Future research should select ads that contrast on only one particular characteristic (i.e., testimonial type ad vs. non-testimonial type ad, or highly emotional testimonial ads vs. less emotional testimonial ads) while controlling for other important characteristics, such as the style and content of ads and sociodemographics of people featured in ads. Since manipulating characteristics of ads among the limited selection of ads may not be feasible,

future research should consider re-producing ads so that they differ in only one of the characteristics of interest. For example, the re-production of the *Oral cancer* ad in Study Two should use a Taiwanese woman whose demographics characteristics match the woman shown in the original *Oral cancer* ad and allow only one contrasting characteristics, i.e., ethnicity, to differ between the original and re-produced *Oral cancer* ads.

Perceived self-efficacy is a key predictor of smoking cessation and sustaining abstinence (Marlatt & Donovan, 2005). For the content of ads tested, graphic content is considered to arouse fear to reduce harmful behaviors. While evidence on the effectiveness of fear appeals is mixed (Ruiter, Abraham, & Kok, 2001; Witte and Allen, 2000), research has suggested that anti-smoking messages incorporate content to enhance the perceived self-efficacy of the target audience (Manyiwa & Brennan, 2012). Findings in Study Two showed some participants reported relatively negative responses to graphic or testimonial ads due to their graphic content and threat appeals. This reflects the potentially counterproductive effect of graphic, emotionally evocative ads, which may be augmented when ad content does not enhance self-efficacy. Future research should examine content that aims to increase self-efficacy by comparing the perceived effectiveness of graphic, emotionally evocative ads with and without the self-efficacy content.

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APPENDIX A – COMPARISON OF SMOKING PROFILE AND TOBACCO CONTROL POLICIES IN CHINA AND TAIWAN

Table A.1 Comparison of smoking profile and tobacco control policies in China and Taiwan

Profile and policies	Year	Taiwan	Year	China
Smoking population	2010	3.6 million adult smokers ¹	2010	320 million smokers ⁵
Smoking prevalence	2010	35.0% of men and 4.1% women smoke (age 18+, 20.0% combined) ¹	2010	52.9% of men and 2.4% women smoke (age 15+, 28.1% combined) ⁵
Cigarette tax	2009 to present	The current tax rate on tobacco is about 50% at the retail price of cigarettes. ²	2008	The tobacco tax is not on the political agenda and little discussions and policy initiatives on increasing taxation on cigarettes. The current tax rate on tobacco is about 40% at the retail price of cigarettes. ⁶
Smoke-free places	2009 to present	Taiwan has a national smoke-free law but does not comprehensively ban smoking in all public places. The THP Act bans smoking in almost all public places and indoor workplaces jointly used by three or more persons with exception of semi-outdoor restaurants, cigar houses, bars and audio-visual businesses which are only open after 9:00 pm and exclusively to persons beyond the age of 18 years; hotels, shopping	2010	China has no national comprehensive smoke-free law. Several national laws and policies regulate smoking in selected public places. For example, Regulations on the Sanitary Administration of Public Places bans smoking in gymnasiums, libraries, museums, art galleries, marketplaces, bookstores, public transport waiting rooms, trains, passenger liners and airplanes. Law of the People's Republic of China on Tobacco Monopoly "bans or restricts smoking in public transportation

malls, restaurants or other business locations for public consumption, and the welfare institutions for the elderly equipped with separate indoor smoking partitions, independent air-conditioning or ventilation systems; outdoor designated smoking areas of the welfare institutions for the elderly, universities and colleges, libraries, museums, stadiums, swimming pools and other entertainment locations.³

vehicles and public venues''. Law of the Peoples Republic of China on the Protection of Minors bans smoking in the classrooms, dorms and activity rooms of middle or primary schools, kindergartens and nurseries. No national level laws restrict smoking in workplaces, restaurants and bars. Sub-national jurisdictions have the authority to implement local smoke-free policies. Guangzhou, Shenzhen, and Beijing are the only cities in China that partially bans smoking in restaurants with the setting up of designated smoking and non-smoking areas.⁷

- 2011 Ministry of Health issued a ban on smoking in 28 selected indoor public places based on "Health Management Ordinance Implementing Regulations for Public Places", including hotels, restaurants, and bars. The policy also prohibits the setting up of the indoor smoking areas, the placement of outdoor smoking areas in walkways frequented by pedestrians, and the placement of cigarette vending machines in public places. No fines are imposed on violators. But this policy does not ban smoking in indoor workplaces and outdoor public places. The ban goes into effect on May 1, 2011. The government has included the smoking ban in all indoor public places in its 12th

Health warning labels on cigarette packs	2009 to present	The THP Act mandates warning labels to consist of texts and graphic images covering at least 35% of the largest front and back of pack surfaces. Six rotating warning labels depict the harmful effects of smoking and SHS (e.g., lung cancer, heart diseases, oral diseases and sexual dysfunction) and contain quitline information. ³	2011 Warning labels are small six point type, text-only on the same background color as the rest of the pack, cover 30% of the pack, in Chinese on the front and in English on the back and appear at the bottom rather than at the top of the pack. The labels consist of only two very general and similar, rotating messages rather than specific and distinct, rotating messages about smoking harms. Tobacco companies are allowed to design their own labels as long as they meet the minimum requirements set by the State Tobacco Monopoly Administration. ^{9,10,11}
Tobacco advertising	2009 to present	The THP Act bans on almost all forms of direct and/or indirect tobacco advertising. The Act does not ban point of sale advertising in retail stores, sponsorship, and any forms of direct and/or indirect tobacco advertising that are not listed in the Act. ³	2011 A national law bans tobacco advertising on movie, television, radio, and in newspapers and magazines but does not ban all other forms of direct and/or indirect advertising. Local jurisdictions have the authority to regulate outdoor tobacco advertising and some have banned it. Tobacco companies can advertise their products at point of sale, through sponsored events and branded schools, on billboards, online, and through extensive advertising of affiliated companies with the same names as tobacco

				brands. Tobacco companies are allowed to use free distribution and promotional discounts to market their tobacco products. Tobacco products are allowed to appear in TV and/or films. ^{12,13}
Mass media campaign	1990s to present	National anti-tobacco mass media campaigns have been implemented by the Department of Health and John Tung Foundation yearly since 1990s. ⁴	2011	No anti-tobacco mass media campaigns have been implemented at the national level. ⁹ Several subnational anti-tobacco mass media campaigns were implemented in 2008, for example, “Smoke-free Beijing” and “Smoke-free Olympics” to discourage smoking, particularly in smoke-free places. ¹⁴

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APPENDIX B –SHARING SOCIO-CULTURAL AND POLITICAL INTERCHANGE BETWEEN CHINA AND TAIWAN

In 1949, as a result of Chinese Civil War between two political parties, the Chinese Nationalist Party or Kuomintang (KMT) and Chinese Communist Party (CCP), on mainland China, the defeated KMT retreated to Taiwan and established the Republic of China (ROC). Before 1971, the United Nations recognized Taiwan as being the rightful government of the Chinese people. However, in 1971 the mainland People's Republic of China took over Taiwan's seat in the United Nations. Since then, China and Taiwan, the two separate sovereignties, have evolved differently in political system of governance: communism versus democracy (Office of Information Services, 2012). Tensions between two sides of Taiwan Strait have disturbed the stability of the area for decades. China claims that Taiwan is part of China and threatens Taiwan's declaration of independence lead to its military attack. On the other hand, KMT has vowed and promoted reunification with China while Taiwan society is divided with respect to the cross-strait relationships. The consensuses of Taiwanese are that Taiwan is an independent country and its future will be decided by its people in a democratic way (Office of Information Services, 2012).

Despite the political issues, Chinese and Taiwanese have many similarities in their language and culture. 95% of Taiwan's population is made up of Han Chinese, descended from successive waves of immigrants who have arrived in Taiwan since the 17th century (Hsiao, 2004; Office of Information Services, 2012).

The remainder is Taiwanese aborigines and recent immigrants mainly from Southeast Asia on the basis of cross-nation marriages and labor force. Ethnically, the vast majority of Chinese and Taiwanese is the same. China and Taiwan use the same official language, Chinese Mandarin. Therefore, Chinese and Taiwanese communicate with each other easily although there are some variations in usage and accent. For written languages, Chinese use the Simplified Chinese system, which was developed by the PRC in 1954 and simplifies Chinese characters from most complex glyphs to fewer strokes in the Traditional Chinese system, which is used in Taiwan. Chinese and Taiwanese celebrate cultural festivals similarly, for example, Lunar New Year, Mid-Autumn Festival. Taiwanese even celebrate centuries-old cultural and religious festivals that have diminished due to Cultural Revolution in China (Sui, 2011).

Taiwan's culture is a blend of Taiwanese aborigines, Confucianist Han Chinese, Japanese, Western cultures, shaped and influenced by the processes of human settlement, imperialism, colonization and globalization (Hsiao, 2004; T Office of Information Services, 2012). A wide diversity of religions is practiced in Taiwan as a result of its multi-cultural history and religious freedom (Office of Information Services, 2012). With stabilized cross-strait relations, Taiwanese have been sharing its preserved Han culture with Chinese and helped them recover and rebuild lost cultural and religious traditions such as Mazu festivals and temples (Sui, 2011). Taiwan's pop culture has even influenced China's long before cross-strait relations improved (Sui, 2011).

Taiwanese values the philosophy of Confucianism that deals with secular moral ethics and maintains harmonious social interaction. Therefore, Chinese and Taiwanese share some socio-cultural values and practices, for example, celebrating festivals and

practicing gift-giving in a similar manner. With eased political tensions and growing economic integration, the socio-cultural interchange of China and Taiwan becomes more frequent and deeper than ever.

APPENDIX C. –ANALYSES NOT INCLUDED IN MANUSCRIPTS FOR STUDY ONE

Table C.1 Factors that predict the recall of the GCGH campaign

Characteristics	Campaign recall					Campaign recall within intervention cities				
	Logistic regression					Logistic regression				
	Bivariate		Multivariate			Bivariate		Multivariate		
	% row	OR	(95% CI)	AOR	(95% CI)	% row	OR	(95% CI)	AOR	(95% CI)
City										
Beijing	20.7%	1				20.7%	1			
Shenyang	11.9%	0.52 (0.28, 0.94)*		0.43 (0.23, 0.82)*		11.9%	0.52 (0.28, 0.94)*		0.43 (0.23, 0.82)*	
Shanghai	6.7%	0.28 (0.15, 0.50)***		0.27 (0.14, 0.52)***		6.7%	0.28 (0.15, 0.50)***		0.28 (0.14, 0.52)***	
Guangzhou	16.6%	0.76 (0.46, 1.24)		0.85 (0.50, 1.44)*		12.3%	0.76 (0.46, 1.24)		0.89 (0.18, 0.89)	
Changsha	12.3%	0.54 (0.26, 1.09)		0.40 (0.18, 0.89)						
Yinchuan	15.8%	0.72 (0.45, 1.14)		0.53 (0.30, 0.92)*						
Age										
Group 18-24	25.2%	1		1		22.4%	1		1	
Group 25-39	16.9%	0.61 (0.21, 1.75)		0.27 (0.80, 0.92)*		18.1%	0.76 (0.16, 3.69)		0.30 (0.07, 1.33)	
Group 40-54	14.5%	0.50 (0.20, 1.31)		0.19 (0.06, 0.61)**		14.8%	0.60 (0.16, 2.26)		0.17 (0.04, 0.76)**	
Group 55+	12.3%	0.42 (0.16, 1.07)		0.16 (0.05, 0.51)**		12.2%	0.48 (0.13, 1.80)		0.14 (0.03, 0.62)*	
Sex										
Male	14.2%	1		1		14.2%	1		1	
Female	14.6%	1.03 (0.52, 2.01)		0.94 (0.44, 1.98)		15.4%	1.11 (0.46, 2.67)		1.05 (0.41, 2.74)	
Marital status										
Married	14.8%	1		1		14.8%	1		1	
Divorced	8.6%	0.54 (0.29, 1.00)		0.27 (0.19, 0.76)**		8.6%	0.44 (0.20, 0.97)*		0.27 (0.10, 0.71)**	

Single	10.5%	0.67 (0.26, 1.77)	0.52 (0.21, 1.76)	10.5%	0.51 (0.14, 1.83)	0.52 (0.14, 1.97)
Income						
Low	15.4%	1	1	14.5%	1	1
Medium	14.5%	0.93 (0.63, 1.38)	0.99 (0.61, 1.61)	15.2%	1.06 (0.62, 1.80)	1.11 (0.60, 2.08)
High	14.0%	0.89 (0.63, 1.27)	0.94 (0.61, 1.45)	14.7%	1.01 (0.63, 1.64)	1.00 (0.56, 1.76)
Education						
Low	13.4%	1	1	11.8%	1	1
Medium	14.5%	1.10 (0.69, 1.77)	0.88 (0.53, 1.46)	14.3%	1.25 (0.66, 2.37)	0.78 (0.39, 1.55)
High	13.6%	1.02 (0.49, 2.10)	0.76 (0.34, 1.68)	15.8%	1.41 (0.55, 3.60)	0.78 (0.31, 1.98)
Smoking status						
Everyday	15.1%	1	1	10.7%	1	1
Some day	14.0%	1.10 (0.62, 1.95)	1.06 (0.60, 1.89)	14.5%	0.71 (0.38, 1.30)	0.64 (0.35, 1.17)
HSI						
0	17.5%	1	1	16.5%	1	1
1	14.9%	0.82 (0.57, 1.19)	0.70 (0.44, 1.10)	16.1%	0.97 (0.66, 1.44)	0.70 (0.42, 1.17)
2	9.9%	0.52 (0.28, 0.98)*	0.54 (0.26, 1.15)	9.8%	0.55 (0.24, 1.24)	0.51 (0.21, 1.25)
3	14.0%	0.76 (0.50, 1.17)	0.73 (0.43, 1.23)	16.0%	0.96 (0.57, 1.61)	0.81 (0.45, 1.48)
4	14.3%	0.78 (0.49, 1.25)	0.83 (0.50, 1.37)	13.8%	0.81 (0.48, 1.36)	0.80 (0.46, 1.39)
5	12.4%	0.67 (0.36, 1.22)	0.76 (0.41, 1.39)	13.8%	0.81 (0.43, 1.54)	0.87 (0.46, 1.67)
6	14.6%	0.81 (0.41, 1.58)	0.85 (0.43, 1.69)	14.3%	0.85 (0.44, 1.61)	1.01 (0.48, 2.13)
Quit intention						
No	13.0%	1	1	13.0%	1	1
Yes	20.6%	1.74 (1.37, 2.37)**	1.64 (1.18, 2.26)**	20.6%	1.64 (1.14, 2.37)*	1.54 (1.06, 2.23)*

Note. Significant levels for ordinal regression: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Adjusted for age group, sex, income, education, marital status, smoking status, intention to quit, exposure to general antismoking campaign, and exposure to the SFO campaign.

Table C.2 Logistic regression analyses of the association between campaign exposure and perceived social disapproval of smoking

Outcome measure	Campaign exposure	Pre-campaign %	Post-campaign %	Diff	Logistic regression ORs (95% CI)	
					Unadjusted	Adjusted
Perceived social disapproval of smoking	Control cities	65%	60%	0%	1	
	Intervention cities	60%	55%	-5%	0.85 (0.67, 1.08)	0.86 (0.68, 1.09)
	Not recalled	60%	54%	-6%	1	
	Recalled	62%	63%	1%	1.46 (1.14, 1.88)**	1.42 (1.01, 1.99)*
	Not recalled	60%	54%	-6%	1	
	1 channel	63%	65%	2%	1.52 (1.09, 2.10)*	1.55 (1.08, 2.22)*
	2+ channels	62%	64%	3%	1.64 (0.92, 2.91)	1.36 (0.71, 2.60)
	Not recalled	60%	54%	-6%	1	
	TV	64%	62%	-1%	1.19 (0.92, 1.55)	1.18 (0.82, 1.71)
	Poster	52%	65%	14%	1.44 (0.69, 3.02)	1.34 (0.64, 2.79)
Mobile media	69%	67%	-2%	1.24 (0.36, 4.22)	1.34 (0.32, 3.81)	

Note. Significant levels for ordinal regression: *p<0.05; **p<0.01; ***p<0.001; Diff= Pre-campaign % - Post-campaign %. Adjusted for age group, sex, income, education, marital status, smoking status, intention to quit, exposure to general antismoking campaign, and exposure to the SFO campaign

Table C.3 Logistic regression analyses of the association between campaign exposure and knowledge of smoking harms

Knowledge measures	Campaign exposure	Pre-campaign %	Post-campaign %	Diff %	Logistic regression ORs (95% CI)		
					Unadjusted	Adjusted	
Campaign-targeted Knowledge	Stroke	Control	20%	28%	8%	1	1
		Intervention	23%	31%	8%	1.12 (0.90, 1.41)	1.09 (0.84, 1.42)
		Not recalled	23%	30%	8%	1	1
		Recalled	26%	39%	13%	1.41 (0.92, 2.15)	1.23 (0.83, 1.84)
	CHD	Control	44%	54%	10%	1	1
		Intervention	46%	56%	10%	1.09 (0.79, 1.52)	1.21 (0.89, 1.64)
		Not recalled	45%	54%	9%	1	1
		Recalled	51%	67%	16%	1.68 (1.07, 2.64)*	1.58 (0.90, 2.80)
	Lung cancer in smokers	Control	73%	82%	9%	1	1
		Intervention	69%	79%	10%	0.91 (0.69, 1.20)	1.07 (0.82, 1.41)
		Not recalled	68%	77%	9%	1	1
		Recalled	74%	92%	18%	3.12 (1.40, 6.95)**	2.64 (1.14, 6.09)*
Not-campaign-targeted Knowledge	Lung cancer in nonsmokers	Control	60%	66%	6%	1	1
		Intervention	61%	71%	11%	1.27 (1.05, 1.54)*	1.36 (1.00, 1.64)*
		Not recalled	60%	69%	10%	1	1
		Recalled	66%	83%	17%	2.10 (1.47, 3.00)***	1.74 (1.21, 2.49)**
	Emphysema	Control	67%	76%	9%	1	1
		Intervention	61%	74%	13%	0.98 (0.75, 1.28)	1.03 (0.74, 1.44)
		Not recalled	61%	73%	12%	1	1
		Recalled	66%	81%	15%	1.53 (1.01, 2.31)*	1.24 (0.77, 1.99)
	Premature	Control	58%	65%	7%	1	1

aging	Intervention	50%	62%	12%	1.01 (0.80, 1.28)	1.16 (0.92, 1.45)
	Not recalled	51%	60%	10%	1	1
	Recalled	49%	76%	27%	2.27 (1.54, 3.36)***	1.84 (1.24, 2.74)**
Impotence	Control	29%	33%	4%	1	1
	Intervention	26%	31%	5%	0.94 (0.69, 1.28)	1.03 (0.77, 1.39)
	Not recalled	26%	30%	4%	1	1
	Recalled	27%	39%	12%	1.50 (1.18, 1.90)**	1.40 (1.10, 1.78)**

Note. Significant levels for ordinal regression: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; Diff= Pre-campaign % - Post-campaign %. Adjusted for age group, sex, income, education, marital status, smoking status, intention to quit, exposure to general antismoking campaign, and exposure to the SFO campaign

Table C.4 Linear regression analyses of the association between campaign exposure and perceived risks of smoking harms

Outcome measure	Campaign exposure	Pre-campaign Mean	Post-campaign Mean	Diff	Linear regression b (SE)	
					Unadjusted	Adjusted
Perceived risks of smoking harms	Control cities	1.96	1.96	0.00	1	1
	Intervention cities	1.77	1.80	0.04	-0.076 (0.031)*	-0.061 (0.039)
	Not recalled	1.76	1.77	0.02	1	1
	Recalled the campaign	1.82	2.00	0.18	0.162 (0.035)***	0.119 (0.035)**
	Not recalled	1.76	1.77	0.02	1	1
	Recalled 1 channel	1.78	1.96	0.18	0.130 (0.049)*	0.073 (0.048)
	Recalled 2 and more channels	1.82	2.04	0.21	0.219 (0.085)*	0.179 (0.095)
	Not recalled	1.76	1.77	0.02	1	1
	Recalled TV	1.79	2.00	0.21	0.168 (0.046)**	0.110 (0.043)*
	Recalled poster	1.80	1.98	0.18	0.004 (0.114)	-0.028 (0.118)
Recalled mobile media	1.74	2.03	0.28	0.050 (0.077)	0.087 (0.078)	

Note. Significant levels for ordinal regression: *p<0.05; **p<0.01; ***p<0.001; Diff=Pre-campaign mean - Post-campaign mean. Adjusted for age group, sex, income, education, marital status, smoking status, intention to quit, exposure to general antismoking campaign, and exposure to the SFO campaign.

Table C.5 Ordinal regression analyses of the association between campaign exposure and campaign-targeted knowledge of smoking harms

Outcome measure	Campaign exposure	Pre-campaign Mean	Post-campaign Mean	Diff	Ordinal regression b (SE)	
					Unadjusted	Adjusted
Knowledge index of smoking harms including stroke, lung cancer in smokers, and cardiovascular disease	Control cities	1.37	1.63	0.26	1	1
	Intervention cities	1.38	1.67	0.28	0.056 (0.109)	0.136 (0.107)
	Not recalled	1.36	1.62	0.25	1	1
	Recalled the campaign	1.51	1.97	0.46	0.511 (0.139)**	0.406 (0.129)**
	Not recalled	1.36	1.62	0.25	1	1
	Recalled 1 channel	1.51	1.89	0.38	0.331 (0.146)*	0.216 (0.137)
	Recalled 2 and more channels	1.45	2.24	0.79	1.165 (0.252)***	0.929 (0.235)***
	Not recalled	1.36	1.62	0.25	1	1
	Recalled TV	1.51	2.02	0.51	0.373 (0.147)*	0.270 (0.136)
	Recalled Poster	1.30	2.10	0.80	0.547 (0.215)*	0.314 (0.220)
Recalled mobile media	1.46	2.14	0.69	0.424 (0.304)	0.466 (0.324)	

Note. Significant levels for ordinal regression: *p<0.05; **p<0.01; ***p<0.001; Diff= Pre-campaign mean - Post-campaign mean. Adjusted for age group, sex, income, education, marital status, smoking status, intention to quit, exposure to general antismoking campaign, and exposure to the SFO campaign.

Table C.6 Negative binomial regression analyses of the association between campaign exposure and campaign-targeted knowledge of smoking harms

Outcome measure	Campaign exposure	Pre-campaign Mean	Post-campaign Mean	diff	Negative binomial regression b (SE)	
					Unadjusted	Adjusted
Knowledge index of smoking harms including stroke, lung cancer in smokers, and cardiovascular disease	Control cities	1.37	1.63	0.26	1	1
	Intervention cities	1.38	1.67	0.28	0.013 (0.034)	0.038 (0.034)
	Not recalled	1.36	1.62	0.25	1	1
	Recalled the campaign	1.51	1.97	0.46	0.168 (0.043)***	0.135 (0.041)**
	Not recalled	1.36	1.62	0.25	1	1
	Recalled 1 channel	1.51	1.89	0.38	0.124 (0.046)*	0.087 (0.042)*
	Recalled 2 and more channels	1.45	2.24	0.79	0.301 (0.069)***	0.244 (0.065)**
	Not recalled	1.36	1.62	0.25	1	1
	Recalled TV	1.51	2.02	0.51	0.131 (0.044)**	0.104 (0.040)*
	Recalled poster	1.30	2.10	0.80	0.152 (0.074)*	0.092 (0.075)
Recalled mobile media	1.46	2.14	0.69	0.089 (0.071)	0.084 (0.073)	

Note. Significant levels for ordinal regression: *p<0.05; **p<0.01; ***p<0.001; Diff= pre-campaign mean - post-campaign mean. Adjusted for age group, sex, income, education, marital status, smoking status, intention to quit, exposure to general antismoking campaign, and exposure to the SFO campaign.

APPENDIX D – RECRUITMENT SCREENING FORM

Introduction: Hi, my name is _____. We are recruiting smokers to participate in a research discussion group to view a set of smoking cessation ads, and discuss their thoughts about the ads and smoking-related issues. I need to ask you a few questions to find out if you are eligible to participate in the study.

1 Sex

- Male
 Female

2 How old are you?

_____ (record age)

3 Do you smoke cigarettes?

- Yes
 No (thank and terminate)

4 Have you smoked at least 100 cigarettes in your lifetime?

- Yes
 No (thank and terminate)

5 Did you smoke at least once in the last week?

- Yes
 No (thank and terminate)

6 On average, how many cigarettes do you smoke per day?

- Less than one per day
 Up to 5 per day
 6-15 per day
 Over 15 per day

7 Are you thinking about quitting in the next 6 months? Yes
 No

8 Have you ever tried to quit smoking in the last 12 months Yes
 No

9 What is your education level? Elementary school or less
 Middle school
 Technical school
 High school
 College or above

Based on your answers to those questions, you would be eligible to participate in the study. Participating in this study would be required to attend a group session with about 8-12 people to discuss your thoughts about smoking and smoking cessation ads. The group will last about 2 hours. You will receive \$10 to compensate for your time in the end of group session. And, you will be followed up by a telephone call to ask your thoughts about smoking one week after the group session. All of the information you provide will be kept confidential.

10 Are you interested in participating in the study? Yes
 No

The group you are eligible for is on _____(date) at _____ (time).
The location is _____.

11 Are you able to attend at this time? Yes
 No

12 Your phone number is _____(mobile),
_____ (office),
_____ (home)

We will contact you to remind you of the group session and conduct a follow-up phone survey one week after the group session.

Thank participant and remind them of time, date and time. Provide them with contact details in case you are unable to make the session.

APPENDIX E – STEPS OF PARTICIPANTS GETTING INVOLVED IN THE STUDY

1. Contact focus group research team and be screened for eligibility and allocated to different groups.
2. Participate in the focus group session.
3. Be introduced to study and given information about study (Consent for Research).
4. Complete the first section of the ad rating questionnaire, i.e., demographics, smoking-related behaviors, and knowledge of smoking-related harms (Page 1-3).
5. View a sample ad twice in a row and rate the sample ad
 - Be instructed to not talk to one another, pay attention to ad, and then fill out a sample evaluation form (show example of how you will do it).
 - Be checked the sample evaluation form to make sure it is correctly filled out
6. View each ad twice in a row and rate the ad
 - View Ad 1 two times and then fill out individual evaluations (Page 4)
 - View Ad 2 two times and then fill out individual evaluations (Page 5)
 - View Ad 3 two times and then fill out individual evaluations (Page 6)
 - View Ad 4 two times and then fill out individual evaluations (Page 7)
 - View Ad 5 two times and then fill out individual evaluations (Page 8)
 - View Ad 6 two times and then fill out individual evaluations (Page 9)
 - View Ad 7 two times and then fill out individual evaluations (Page 10)
 - View Ad 8 two times and then fill out individual evaluations (Page 11)

7. Rate the best and worst ads among all ads
 - Be instructed to select and rank the three ads that make them feel most like trying to quit (Page 12).
 - Be instructed to select and rank the three ads that make them feel least like trying to quit (Page 13).

8. Compare five pairs of ads that contrast with each other on particular ad characteristics of interest.
 - Select the better ad that make them feel most like trying to quit (Page 14)
 - Select the better ad that make them feel most like trying to quit (Page 15)
 - Select the better ad that make them feel most like trying to quit (Page 16)
 - Select the better ad that make them feel most like trying to quit (Page 17)
 - Select the better ad that make them feel most like trying to quit (Page 18)

9. Discuss each ad in a group
 - Introduce themselves, and mention how long they have been smoking, their current smoking status (i.e., smoke daily vs. smoke occasionally)
 - View Ad 1 and then have discussion of
 1. *What do you think is the main message of this ad?*
Probe: what else is it trying to say?
 2. *How does this ad make you feel?*
 3. *What do you think about the believability of the ad?*
Probe: what would make it more convincing to you?
 4. *What, if anything, have you learned from the ad that you did not know before?*

5. *What do you understand about the ad?*

6. *What do you not understand about the ad?*

Probe: what would make it more understandable?

7. *How relevant do you think the ad is to you?*

8. *How effective do you think the ad is in motivating you to quit smoking?*

9. *What element of the ad makes you think about quitting?*

Probe: why do you think the ad does (or does not) motivate you to quit?

➤ Repeat for each Ad

10. Return the questionnaire and receive \$17 for participating in the research

11. Be reminded of the follow-up telephone survey one week after the focus group session.

Write down phone number, other contact info, and time that are best to reach for follow-up.

APPENDIX F – CONSENT FOR RESEARCH

Invitation to Participate & Purpose

You are being invited to participate in a study being conducted by investigators from The University of South Carolina in the United States. The purpose of this study is to understand smokers' comprehension, acceptability, and perceived effectiveness of a set of smoking-related television advertisements that have been broadcast in Taiwan, United States, and other countries.

Voluntary Participation

Your participation in this study is completely voluntary. There is no penalty for declining to participate, and you may discontinue the study at any time. If you choose to do so, any information derived from your participation will be deleted from the study findings.

Methods and Procedures

The methods of data collection for this study include an advertisement rating questionnaire, followed by a focus group discussion, and one week after the focus group, a telephone call to assess recall. The group discussion sessions will be audio-taped with your permission, and transcribed to ensure accurate reporting of the information that you provide. If you give us permission to record the discussions, the recording will be stored

on a password protected computer until the study is over. After the study is over, the recording will be destroyed. The researchers and transcribers will sign a form stating that they will not discuss any item on the recordings with anyone other than the research team. No one's name will be asked or revealed during the focus group. However, should another participant call you by name, the transcribers will be instructed to remove all names from the transcription. The study will take about 2 to 2.5 hours for the focus group and 10 minutes for the follow-up phone survey.

Confidentiality

Your name or other identifying information will not be linked to any of your responses. Your participation is completely confidential. The only form with identifying information will be this consent form, which will be destroyed once the study has been completed. All findings used in any written reports or publications resulting from this study will be reported in aggregate form with no identifying information. However, there is a potential for a breach of confidentiality because focus group participants may share information discussed in focus groups outside the data collection setting. Participants will be instructed to keep the information provided in the groups confidential in the consent form and introduction to focus groups.

Risks and benefits

There are minimal risks associated with this study, which might include psychological discomfort with the type of anti-smoking advertisements that evokes negative emotions such as anger, sad, and fear. Should you experience such a distress and need help to manage it, you can contact the researchers for resources. A potential direct benefit to you for participating in this study may include enhancing your knowledge

about smoking harms and motivation to quit smoking. The benefits to society would be that more smokers will be motivated to quit smoking because of evidence-based, effective anti-smoking advertisements.

Questions

You will be given a copy of this consent form to keep for your records. If you have any questions about this study, please contact the researcher, Li-Ling Huang, by mobile phone at 0976124825 or by email at smokerstudy@pchome.com.tw.

APPENDIX G – MODERATOR GUIDE

Purpose of the guide

This research guide has been developed for the use of the group Moderator for efficient and consistent conduct of the quantitative component of the research and to prompt discussion amongst the participants. This guide will be used to steer discussion to the key aspects of the advertisement to be covered, and the specific questions of interest within each aspect. The aspects include communication, comprehension, relevance, and effectiveness.

For the purposes of qualitative research, these structured questions are not necessarily asked exactly as they are worded here. Focus group discussions should be more like a conversation to stimulate participants to speak openly and freely. The Moderator will need to probe with questions such as “Why?” and “What does that mean to you?” in order to understand participants’ responses. The Moderator will also need to make sure that all participants in the group have an opportunity to express their opinions. Because each group of participants may be different (i.e., smoking intensity), a responsive approach should be used for the research. Therefore, a level of flexibility should be taken in the conduct of each group to allow individual and group reactions to issues and to the advertisements. For this reason, the groups may vary in terms of the detailed topics and the order in which issues are discussed.

Materials Needed

- One set of stapled rating questionnaire (Appendix F) for each participant in the group (15 copies for each group)
- Laptop computer – that has been checked for media connection working properly for playing advertisements in the conference room where focus group is undertaken prior to the group starting
- Video files for all the advertisement in order – check which order is on the survey forms prior to the groups session to ensure the survey forms match the ad order.
- Projector and/or laptop speaker (if the room is not equipped with audio).
- Note taker forms to help with note taking, particularly for the group discussion.
- Digital recorder and a backup
- Outline of focus group activities
- Pencils and pens
- Compensation and receipt book.
- Drinking water and snack

Introduction to participants:

Introduce Group Moderator and Research Assistant. –

“Hello, my name is, I will be conducting the group discussion today, and this is, who will assist me by taking notes.”

Thank participants for their time and contribution.

Explain what the research is about and confidentiality of the research. –

“We’re here to find out about your responses to different smoking cessation ads. Your participation in this study is completely voluntary. There is no penalty for declining to participate, and you may stop your participation in the study at any time. Your personal details are confidential, and we will not keep or pass on any personal information about you. Please read the Consent for Research carefully and feel to ask us questions now.”

Explain the procedure of advertisement rating. –

“First of all I will show you eight different advertisements. Each ad will be played twice and after the second time I want you to fill out the one-page form that corresponds to that ad. After we have rated all eight ads individually, I will ask you to compare the ads, and then we will have a group discussion about each of the ads.”

Rating advertisements

Ask all participants to turn off their mobile phones (if they have them).

Hand out Advertisement Rating questionnaire and speak to participants:

“There are a few short questions about your background on the front of the booklet, and on the second page about knowledge of smoking-related diseases. Please answer these questions now.”

The moderator should read out the questions and the response frames. Explain each response frame if necessary and be confident that everyone understands it before proceeding.

“Does everyone understand what to do? Now, I am going to show you the first ad twice, without stopping. After we have watched each advertisement twice we would like you to fill in the questionnaire page for that advertisement. Please do not discuss the advertisement or say anything to anyone else at this stage.”

Show first ad twice then ask participants:

“Okay, now please fill in the one page questionnaire for this ad and please do not speak to anyone about it. When you have finished the questions on this page, please wait quietly for others to finish.” (If needed, the moderator may read out the questions one by one for the first ad and explain the response categories.)

Once everyone has finished the questions, ask them to turn to the next page, and show the second ad twice. Again, remind them not to discuss it and ask them to fill in the one-page questionnaire for that ad. Repeat the process for all of the eight ads.

Overall rating

Once all the eight ads have been shown, ask participants to do overall ad ratings:

“Would you now answer the questions regarding overall ad ratings for all the eight ads? Take your time, but please do not discuss your answers with others. Remember to select only three ads for each question.”

Then ask participants to do ad ratings for five pairs of ads.

Once everyone has finished, begin the group discussion.

Group discussion

Explain recording and confidentiality of participant information.

“With your permission we would like to record the group. The recording will only be used to help us with analyzing the results. Your personal details are confidential, and we will not keep or pass on any personal information about you. Is it OK for us to record the group?”

Explain the importance of honest opinions.

“Your views and experience are important, so we would like you to tell us what you think and feel about your experiences and about each of the advertisements we show you. There are no right or wrong answers to anything we are discussing today, so it is important that you provide us with your honest opinions and that you understand that we will not make any judgements of you for your opinions. Also, as we are talking about your personal opinions and experiences, it is not necessary for everyone to agree with each other. It is helpful for us to find out the different opinions that people have, as well as where people have the same opinions, so please feel free to tell us whatever you think and feel, even if it might be different to what other people in the room are saying.”

Turn the recording equipment on to record this part of the research – the recording will help with analysing the results and key points from the discussion.

Ask all participants to introduce themselves. These questions/answers help participants feel more relaxed knowing that others in the group are similar to themselves.

“Before we start, it would help us to know a little bit about each of you. Could we go around the group and please tell me about your smoking, including how you

started smoking, the number of cigarettes you would normally smoke per day, and maybe whether you have thought about and tried quitting smoking.”

Show the next ad – this will be first ad once more. Then, prompt the group with the following semi-structured questions.

1. *What do you think is the main message of this ad?*

Probe: what else is it trying to say?

2. *How does this ad make you feel?*

3. *What do you think about the believability of the ad?*

Probe: what would make it more convincing to you?

4. *What, if anything, have you learned from the ad that you did not know before?*

5. *What do you understand about the ad?*

6. *What do you not understand about the ad?*

Probe: what would make it more understandable?

7. *How relevant do you think the ad is to you?*

8. *How effective do you think the ad is in motivating you to quit smoking?*

9. *What element of the ad makes you think about quitting?*

Probe: why do you think the ad does (or does not) motivate you to quit?

Repeat this process for each of the remaining ads. Then go on an overall assessment of which ad most motivates participants to quit smoking. The moderator may need to probe with questions such as “Why?” and “What does that mean to you?” in order to understand participants’ responses. Some of these questions will be used when asking participants to talk about the best and worst ones amongst the eight ads.

Once focus group discussions end, collect the questionnaires and put the group cover sheet on top of all the questionnaires and bind the cover sheet and all the questionnaires together with an elastic band. Please remember to write down, on the group cover sheet, which group you are working with (e.g., Group A, B, C, or D).

To wrap up the discussion, the moderator will express appreciation to participants and distribute the incentive to each participant. Then, the moderator will remind participants of the follow-up telephone survey one week after the focus group session, and ask them to write down their phone numbers or other contact information, and time that are best to reach for follow-up.

APPENDIX H – ADVERTISEMENT RATING QUESTIONNAIRE

Before we begin, please read the questions and check the boxes to describe yourself.

- 1 Are you: Male
Female
- 2 Are you: _____ years old
- 3 On average, how many cigarettes do you smoke per day? I don't smoke everyday
Less than one per day
Up to 5 per day
6-15 per day
More than 15 per day
- 4 Are you thinking about quitting in the next 6 months? Yes
No
- 5 Have you tried to quit smoking in the last 12 months? Yes
No
- 6 What is your education level? Elementary school or less
Middle school
Technical school
High school
College or above
- 7 What is your monthly household income? NT\$ 20,000 or less
NT\$ 20,001 - NT\$ 40,000
NT\$ 40,001 - NT\$ 60,000
NT\$ 60,001 - NT\$ 80,000
NT\$ 80,001 - NT\$ 100,000
NT\$ 100,001 or above

The following is a list of health effects and diseases that may or may not be caused by smoking cigarettes. Based on what you know or believe, please answer the following questions.

- 1 Does smoking cause stroke? Yes
No
Don't know
- 2 Does smoking cause lung cancer? Yes
No
Don't know
- 3 Does smoking cause emphysema? Yes
No
Don't know
- 4 Does smoking cause laryngeal cancer? Yes
No
Don't know
- 5 Does smoking cause oral cancer? Yes
No
Don't know
- 6 Does smoking cause CHD? Yes
No
Don't know
- 7 Does smoking cause COPD? Yes
No
Don't know
- 8 Does smoking causes stomach cancer Yes
No
Don't know
- 9 Does smoking cause chicken pox? Yes
No
Don't know
- 10 Does smoking cause esophageal cancer? Yes
No

11 Does smoking cause bad breath and oral diseases?

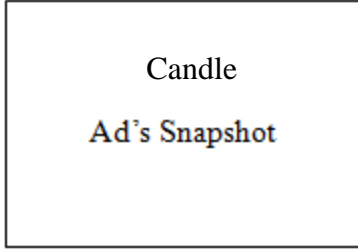
Don't know

Yes

No

Don't know

STOP



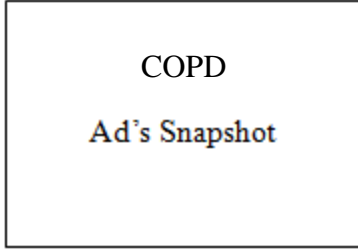
For this ad, please check the box below to indicate whether you have seen this ad and whether you strongly disagree, disagree, agree, or strongly agree to each of the statements about the ad below.

A0 Have you seen this ad before today? Yes No

Please answer the questions below about this ad...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
A1 This ad was easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A2 This ad taught me something new	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A3 This ad makes me stop and think	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A4 This ad is believable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A5 This ad makes me feel uncomfortable, sad, or frightened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A6 This ad speaks to people like me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A7 This ad makes me feel more concerned about my smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A8 This ad makes me more likely to try to quit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A9 This ad is an effective anti- smoking ad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A10 I would be likely to talk to someone else about this ad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

STOP



For this ad, please check the box below to indicate whether you have seen this ad and whether you strongly disagree, disagree, agree, or strongly agree to each of the statements about the ad below.

A0 Have you seen this ad before today? Yes No

Please answer the questions below about this ad...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
A1 This ad was easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A2 This ad taught me something new	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A3 This ad makes me stop and think	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A4 This ad is believable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A5 This ad makes me feel uncomfortable, sad, or frightened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A6 This ad speaks to people like me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A7 This ad makes me feel more concerned about my smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A8 This ad makes me more likely to try to quit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A9 This ad is an effective anti-smoking ad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A10 I would be likely to talk to someone else about this ad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

STOP

1200 Dead
Ad's Snapshot

For this ad, please check the box below to indicate whether you have seen this ad and whether you strongly disagree, disagree, agree, or strongly agree to each of the statements about the ad below.

A0 Have you seen this ad before today? Yes No

Please answer the questions below about this ad...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
A1 This ad was easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A2 This ad taught me something new	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A3 This ad makes me stop and think	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A4 This ad is believable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A5 This ad makes me feel uncomfortable, sad, or frightened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A6 This ad speaks to people like me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A7 This ad makes me feel more concerned about my smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A8 This ad makes me more likely to try to quit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A9 This ad is an effective anti-smoking ad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A10 I would be likely to talk to someone else about this ad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

STOP

Oral Cancer
Ad's Snapshot

For this ad, please check the box below to indicate whether you have seen this ad and whether you strongly disagree, disagree, agree, or strongly agree to each of the statements about the ad below.

A0 Have you seen this ad before today? Yes No

Please answer the questions below about this ad...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
A1 This ad was easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A2 This ad taught me something new	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A3 This ad makes me stop and think	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A4 This ad is believable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A5 This ad makes me feel uncomfortable, sad, or frightened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A6 This ad speaks to people like me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A7 This ad makes me feel more concerned about my smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A8 This ad makes me more likely to try to quit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A9 This ad is an effective anti-smoking ad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A10 I would be likely to talk to someone else about this ad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

STOP



For this ad, please check the box below to indicate whether you have seen this ad and whether you strongly disagree, disagree, agree, or strongly agree to each of the statements about the ad below.

A0 Have you seen this ad before today? Yes No

Please answer the questions below about this ad...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
A1 This ad was easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A2 This ad taught me something new	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A3 This ad makes me stop and think	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A4 This ad is believable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A5 This ad makes me feel uncomfortable, sad, or frightened	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A6 This ad speaks to people like me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A7 This ad makes me feel more concerned about my smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A8 This ad makes me more likely to try to quit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A9 This ad is an effective anti-smoking ad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A10 I would be likely to talk to someone else about this ad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

STOP

Overall Rating

Out of all the ads you saw today, which one ad made you feel most like trying to quit?
Please select and rank the top three ads.

<input type="checkbox"/> <p>COPD Ad's Snapshot</p>	<input type="checkbox"/> <p>Artery Ad's Snapshot</p>
<input type="checkbox"/> <p>Duo Ad's Snapshot</p>	<input type="checkbox"/> <p>Candle Ad's Snapshot</p>
<input type="checkbox"/> <p>Smile Ad's Snapshot</p>	<input type="checkbox"/> <p>Oral Cancer Ad's Snapshot</p>
<input type="checkbox"/> <p>Sponge Ad's Snapshot</p>	<input type="checkbox"/> <p>1200 Dead Ad's Snapshot</p>

STOP

Overall Rating

Out of all the ads you saw today, which one ad made you feel least like trying to quit?
Please select and rank the top three ads.

<input type="checkbox"/> <p>COPD Ad's Snapshot</p>	<input type="checkbox"/> <p>Artery Ad's Snapshot</p>
<input type="checkbox"/> <p>Duo Ad's Snapshot</p>	<input type="checkbox"/> <p>Candle Ad's Snapshot</p>
<input type="checkbox"/> <p>Smile Ad's Snapshot</p>	<input type="checkbox"/> <p>Oral Cancer Ad's Snapshot</p>
<input type="checkbox"/> <p>Sponge Ad's Snapshot</p>	<input type="checkbox"/> <p>1200 Dead Ad's Snapshot</p>

STOP

Rating 1

Between the following two ads you saw today, which one made you feel more like trying to quit?

<input type="checkbox"/>	<p>Sponge Ad's Snapshot</p>
<input type="checkbox"/>	<p>Artery Ad's Snapshot</p>

STOP

Rating 2

Between the following two ads you saw today, which one made you feel more like trying to quit?

<input type="checkbox"/>	<p>Candle Ad's Snapshot</p>
<input type="checkbox"/>	<p>Duo Ad's Snapshot</p>

STOP

Rating 3

Between the following two ads you saw today, which one made you feel more like trying to quit?

<input type="checkbox"/>	<p>Candle Ad's Snapshot</p>
<input type="checkbox"/>	<p>Artery Ad's Snapshot</p>

STOP

Rating 4

Between the following two ads you saw today, which one made you feel more like trying to quit?

<input type="checkbox"/>	<p>Smile Ad's Snapshot</p>
<input type="checkbox"/>	<p>Oral Cancer Ad's Snapshot</p>

STOP

Rating 5

Between the following two ads you saw today, which one made you feel more like trying to quit?

<input type="checkbox"/>	<p>Candle Ad's Snapshot</p>
<input type="checkbox"/>	<p>Oral Cancer Ad's Snapshot</p>

STOP

APPENDIX I – FOLLOW-UP TELEPHONE SURVEY

- 1 Do you recall any of the ad that you saw in the focus group session? Yes (continue to Q2)
 No (thank and terminate)
- 2 Which of the ad that you recall most immediately in the focus group session? Candle
 Duo
 COPD
 Sponge
 Artery
 1200 dead
 Oral cancer
 Teeth
- (write down the interviewee's description):

- 2a Have you thought about this ad since you saw it in the focus group session? Yes
 No
 Don't know
- 2b Have you discussed this ad with someone not in the focus group since you saw it in the focus group session? Yes
 No
 Don't know
- 2c Have you tried to quit smoking since you saw it in the focus group session? Yes
 No (skip to Q3)
 Don't know (skip to Q3)
- 2d Have the ad made you try to quit since you saw it in the focus group session? Yes
 No
 Don't know

- 2e Do you think the ad is an effective anti-smoking ad? Yes
 No
 Don't know
- 3 Do you recall any other ads that you saw in the focus group session? Yes (continue to Q4)
 No (thank and terminate)
- 4 Which of the ad that you recall in the focus group session?
 (write down the interviewee's description):

- Candle
 Duo
 COPD
 Sponge
 Artery
 1200 dead
 Oral cancer
 Teeth
- 4a Have you thought about this ad since you saw it in the focus group session? Yes
 No
 Don't know
- 4b Have you discussed this ad with someone not in the focus group since you saw it in the focus group session? Yes
 No
 Don't know
- 4c Have you tried to quit smoking since you saw it in the focus group session? Yes
 No (skip to Q5)
 Don't know (skip to Q5)
- 4d Have the ad made you try to quit since you saw it in the focus group session? Yes
 No
 Don't know
- 4e Do you think the ad is an effective anti-smoking ad? Yes
 No
 Don't know

- 5 Do you recall any other ads that you saw in the focus group session? Yes (continue to Q6)
 No (thank and terminate)
- 6 Which of the ad that you recall in the focus group session?
(write down the interviewee's description):

_____ Candle
 Duo
 COPD
 Sponge
 Artery
 1200 dead
 Oral cancer
 Teeth
- 6a Have you thought about this ad since you saw it in the focus group session? Yes
 No
 Don't know
- 6b Have you discussed this ad with someone not in the focus group since you saw it in the focus group session? Yes
 No
 Don't know
- 6c Have you tried to quit smoking since you saw it in the focus group session? Yes
 No
 Don't know
- 6d Have the ad made you try to quit since you saw it in the focus group session? Yes
 No
 Don't know
- 6e Do you think the ad is an effective anti-smoking ad? Yes
 No
 Don't know

(Thank interviewee to wrap up the follow-up survey)

APPENDIX J – CODE BOOK

Table J.1 Codebook

Coding category	Coding category
(1) Organizational code	(2) Theoretical code
Main message	Age
Understood	Sex
Not understood	Race
Emotion	Perceived severity
Credibility	Perceived susceptibility
New information	
Relevance	
Stop and think	(3) Substantive code
Concerned	Ad order
Talk about	Addition
Try to quit	Avoidance
Effective	Before-and-after change
Best ad	Counterargument
Worst ad	Direct link between smoking and diseases
Sponge vs. Artery	External health effect
Candle vs. Duo	Free choice
Candle vs. Artery	Internal health effect
Smile vs. Oral cancer	Past knowledge and experience
Candle vs. Oral cancer	Peer pressure
Foreign vs. domestic ad	Short-lived effect
Sponge	Suggestions to improve ads
Artery	
Candle	
Oral cancer	
1200 dead	
Duo	
COPD	
Smile	
Other	

APPENDIX K – AN EXAMPLE MATRIX FOR DISPLAYING DATA

Table K.1 An example matrix of participants' responses across ads and focus groups

Ad	Focus group	Main message
1200 dead	A1	This ad talked about smoking causes 1200 deaths a day.
	A8	The ad shows a bunch of people fell down outside a major tobacco company suddenly. I cannot understand this until I watched it the second. It means smoking kills 1200 people everyday. Then, another poster said "do you think about taking a day off?" I think it is not effective in terms of smoking cessation but is effective if it aims to promote anti-smoking.
	B4	Tobacco company kills people.
	B3	The ad tried to address global justice to protest tobacco company for making huge profit by selling cigarettes that kill people.
Duo	A4	Smoking causes chronic diseases. Smokers need to reduce smoking.
	A5	The ad pointed out four smoking-related cancers.
	A7	I don't think these cancers mentioned in the ad are necessarily caused by smoking. These cancers can be caused by other factors.
	A1	I think this ad targets at the age group above 40.
	B2	Two characters acted like in a soap opera show and advised viewers to quit smoking to avoid getting cancers like them.
	B3	Smoking and chewing betel nuts are bad to your health.

APPENDIX L – ANALYSES NOT INCLUDED IN MANUSCRIPTS FOR STUDY TWO

Analysis of the transcripts from focus groups discussions indicated that several factors or subthemes explain why smokers perceived certain type of ads as more or less effective in motivating them to think about quitting: emotional arousal elicited by ads, relevance of ads, perceived susceptibility to and severity of diseases caused by smoking, comprehension of ads, credibility of ads, and avoidance.

Emotional arousal

The most common negative emotion described by smokers is frightening, shocking, and disgusting. “I got goosebumps when I heard her struggling with talking and coughing because of the hole in her throat.” “Every word she said seemed to make her breathing very difficult. I would reduce my smoking to avoid ending up like her. This is the most effective smoking cessation ad among all.” “As soon as the old lady with the hole in her throat spoke, I felt very frightened. It motivated me to quit smoking because it is very, very frightening” (*Candle*)

“Among all the ads, this one made me feel most uncomfortable and threatened, and made me most feel like quitting smoking. I felt like I was watching a horror movie.”

(*Oral cancer*)

For those ads considered less effective and motivating such as Smile, 1200 dead, duo and COPD, most smokers described having no emotional response to these ads.

“I did not have any feelings about the ad although I found it creative.”

“I felt nothing about the ad. I would forget about it right away. It is not effective at all.”
(*Smile*) “I understood the ad, but I did not feel anything about it.” “The two characters seemed happy to run into each other in hospital and chatted about their illnesses” (Duo).

Relevance

Most smokers reported those ads that they found irrelevant to them are also ineffective in motivating them to quit smoking. The qualitative discussions revealed that the age, smoking characteristics, and lifestyle or profession of characters featured in ads have more influence in smokers’ perceived relevance of the ad than other characteristics such as race, nationality and gender.

“I had no feelings about this ad and don't feel relevant to me because the characters are older than me and have longer history of smoking than me.” (*Duo*)

“I do not smoke that much (compared to the smoking intensity described in the ad), so I feel the ad has limited effect on me. I do not think my lungs have accumulated tar that much.” (*Sponge*)

Many smokers spontaneously mentioned the lack of perceived susceptibility of smoking-attributed diseases depicted in ads by comparing their relatively younger age to the age of characters in ads. Age appears to be the key sociodemographic characteristics of people featuring in ads that smoker more often relate to or not.

“I would imagine that after two years my artery would develop such a problem like the character (this participant was two years younger than the character in the ad). But, if

the character is 50 years old, I would think it will take another 20 years for me to become like that (laugh). I think this is why the ad is effective.” (*Artery*)

“The character's age is similar to my age. I would wonder whether my teeth will look like hers 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*)

In addition, several smokers also counterargued about actors' lifestyle and other risky health behaviors.

“They (actors) 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.” “I neither drink nor chew betel nut. I won't quit smoking because of this ad.” (*Duo*)

When probed about whether ads that feature people who share sociodemographic characteristics, particularly race and nationality, with them has more influence in relating to ads and motivating them to quit than ads that feature people who do not share characteristics, most smokers responded that race and nationality did not influence their personal relevance and appraisal of the ads.

“Taiwanese can die from smoking so foreigners can, can they not? I do not think the ad is less relevant to me because the race of the character is different from mine.”

(*Candle vs. Duo*)

As expected, smokers considered *1200 dead* was less irrelevant to them and was less effective than ads with other messaging styles because of low personal relevance of anti-

tobacco industry agenda among smokers. A majority of smokers thought that *1200 dead* spoke to tobacco industry, not smokers or general public.

“The ad targets at tobacco company, not smokers. But it is not effective for tobacco company because they still produce and sell cigarettes. It is not about quitting, so it is not effective for smokers neither.” (*1200 dead*)

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*).

“I do not understand why people blew balloons. Was the ad trying to describe their lungs were swollen like a balloon or what?” “I still do not know what COPD represents after I watched the ad twice.” (*COPD*)

“The ad did not explicitly mention what cancer the woman got from her smoking and how smoking caused her to have a hole in her throat. It (hole) can be caused by other diseases, not just by smoking.” (*Candle*)

These comprehension issues clearly impeded smokers’ understanding of the main messages of ads and diminished their perceptions of ad effectiveness.

Credibility

The visual metaphor used in *Sponge* did not present comprehension problems but caused a credibility issue among smokers. Some smokers questioned about the color and amount of tar and therefore concluded that the ad exaggerated the real quantity of tar that can be accumulated in lungs. However, the visceral image of a diseased body part in *Artery* that smokers have not seen before made them question about its authenticity, thus causing credibility and acceptance issues about the ad. “*It looks more like a section of intestine than blood vessel.*” Some smokers also raised doubts about the linkage between specific disease outcomes and smoking, particularly in *Oral cancer* and *Artery*. For example, those smokers who regarded *Oral cancer* as ineffective questioned the credibility of this ad because they thought oral cancer or diseases are most likely caused by betel quid chewing, which is prevalent in Taiwan and make its users’ mouth and teeth stained with betel quid juice, rather than smoking alone.

“The black stuff looks like engine oil. I think the ad exaggerated the real quantity and color of the tar.” (*Sponge*)

“I see people who have a betel quid chewing habit usually have bad teeth like that.”
“I have seldom seen a smoker who does not chew betel quid have bad teeth.” “I do not believe it (oral cancer) is caused by smoking alone. Only can chewing betel quid cause such damage to mouths and teeth.” (*Oral cancer*)

“I think it (a section of artery) look like an intestine. I think fat squeezed out of this thing has more to do with eating than smoking.” (*Artery*)

Avoidance

A few smokers reported that they would switch to other channels if viewing *Oral Cancer* on TV because they resented ad for its fear appeal, which made them feel very uncomfortable or exaggerated health consequences. “I felt immediately disgusted when viewing the first scene of the ad and didn't want to continue watching it. I felt a strong aversion to this ad.”

Several ad characteristics were examined through discussions of five pairs of ads and results are listed below.

Visceral imagery vs. visceral metaphor (*Artery vs. Sponge*)

Consistent with quantitative data on the level of negative emotion, smokers felt higher emotional arousal to *Artery* using visceral imagery of a section of artery than to *Sponge* using visceral metaphor of a lung. The use of a blackened sponge as human lungs did not present comprehension difficulty among smokers, but a few smokers suggested the use of real diseased lungs would arouse greater fear and shock, thereby making the ad more convincing than the use of a sponge.

More human suffering vs. less human suffering (*Candle vs. Duo*)

The qualitative discussions reinforced that ad characteristics played a more important role in the appraisal of antismoking ads than congruence of demographic characteristics of the people featured in the ads and the smokers who are exposed to the ads Targeting anti-tobacco ads to the sociocultural characteristics of target audiences may yield higher effectiveness; nevertheless, discussion around the relative performance

of two testimonial ads, *Candle* and *Duo*, indicated that a white woman who represented a graphic and emotional portrayal of throat cancer from smoking was more effective than a Taiwanese male with less graphic and emotional portrayal of smoking-related diseases. Smokers generally commented that foreign ads that were produced by foreign countries or featuring foreign people (i.e., *Oral cancer*, *Artery*, *Candle*) were more powerful and motivating than Taiwanese ads (i.e., *COPD*, *Duo*, *Smile*) because these ad made them more fearful for smoking harms.

Testimonial vs. visceral imagery (*Candle* vs. *Artery*)

Focus group discussions of the paired ads, *Candle* vs. *Artery* reflect similar rating of the two ads, both individual and paired rating. Some smokers reported they responded more favorably to *Candle* because they felt stronger responses to external health effect while some responded favorably more to *Artery* because they felt strong responses to internal health effect. Credibility, comprehension and relevance also come into play in smokers' appraisals of the two ads. However, many smokers specifically noted that real people make the ad more believable, and make them more connected to their pain and suffering from smoking harms, thereby motivating them to think about quitting smoking. This is consistent with the quantitative finding that smokers gave significantly the highest rating on *Candle*, a testimonial ad, among all ads.

Fear appeal vs. humor appeal (*Oral cancer* vs. *Smile*)

Smokers overwhelmingly rejected *Smile* and its use of humorous appeals when compared to the *Oral cancer* ad, which used a fear appeal. Smokers commented *Smile*, though creative because it manipulated cigarette package health warning labels to look

like smoker's teeth, made them think the ad as a joke. This led them to perceive the ad as ineffective for smoking cessation. Some thought the ad can even produce an unwanted effect that young people just make fun of the health warning labels by mimicking its manipulation of the labels and disregard health consequences conveyed by the labels.

Real people vs. actors (*Candle vs. Oral cancer*)

Smokers commonly did not think whether ad characters are real people or actors influence their perceived effectiveness of the ad as long as the ad achieves its fear appeal. Only one smoker said that he would appreciate ads using real people instead of actors because real people make the ad even more convincing.

Table L.1. Ad ratings on perceived effectiveness and other individual measures

Measurement	Variable	Oral Cancer	Artery	Candle	Sponge	COPD	Duo	1200 Dead	Smile	
		Percent / Mean (sd) / Ranking								
219 Perceived Effectiveness (PE) Scale	Exposure	0.0%	3.7%	0.0%	68.5%	44.4%	35.2%	0.0%	1.9%	
		4.0 ^a	3.7 ^{ab}	3.7 ^{ab}	3.7 ^{ab}	3.4 ^{bc}	3.4 ^{bc}	3.1 ^{cd}	2.9 ^d	
	Index score	(0.7)	(0.7)	(0.7)	(0.6)	(0.8)	(0.7)	(0.9)	(0.8)	
	Makes me stop and think	4.3 (0.7)	3.9 (0.8)	4.0 (0.8)	3.9 (0.7)	3.6 (1.0)	3.5 (0.9)	3.5 (1.0)	3.1 (1.0)	
	Makes me concerned about smoking	4.0 (0.9)	3.9 (0.9)	3.7 (0.9)	3.8 (0.8)	3.5 (0.9)	3.4 (0.9)	3.0 (1.1)	3.0 (1.0)	
	Makes me more likely try to quit	3.9 (0.8)	3.6 (0.9)	3.6 (1.0)	3.6 (0.9)	3.4 (0.9)	3.3 (1.0)	2.9 (1.1)	2.8 (1.0)	
	Effective	4.1 (0.9)	3.8 (0.8)	3.9 (1.0)	3.9 (1.0)	3.4 (1.0)	3.6 (0.9)	2.9 (1.2)	2.6 (1.2)	
	Talk to someone else about the ad	4.0 (0.9)	3.9 (0.9)	3.7 (0.9)	3.8 (0.8)	3.5 (0.9)	3.4 (0.9)	3.0 (1.1)	3.0 (1.0)	
	Comprehension	Easy to understand	4.5 ^a (0.7)	4.2 ^{ab} (0.7)	4.1 ^{ab} (0.9)	4.5 ^a (0.5)	4.1 ^{ab} (0.9)	4.3 ^{ab} (0.7)	3.9 ^b (1.0)	4.0 ^b (0.9)
	Novelty	Teaches me something new	3.7 ^a (0.9)	3.9 ^a (0.9)	3.1 ^{bc} (1.0)	3.7 ^a (0.8)	3.8 ^a (1.1)	3.4 ^{ab} (0.9)	3.4 ^b (1.2)	2.6 ^c (1.0)

Credibility	Believable	4.1 ^a (0.9)	3.7 ^{abc} (0.8)	3.9 ^{ab} (0.9)	3.8 ^{ab} (1.0)	4.0 ^{ab} (0.8)	4.0 ^{ab} (0.9)	3.5 ^{bc} (1.0)	3.2 ^c (1.0)
Emotion	Make me feel uncomfortable	4.4 ^a (0.8)	3.6 ^{bc} (0.9)	4.0 ^{ab} (0.8)	3.2 ^c (1.1)	2.4 ^d (1.1)	2.5 ^d (1.0)	2.4 ^d (0.9)	2.3 ^d (0.9)
Relevance	Speaks to people like me	3.5 ^a (1.0)	3.4 ^{ab} (0.9)	3.5 ^a (1.0)	3.4 ^a (0.9)	3.1 ^{ab} (1.0)	2.9 ^{ab} (0.9)	3.2 ^b (1.0)	2.9 ^{ab} (1.0)
Ranking	Rank by PE score	1	2	3	4	5	6	7	8
	% Ranked as the best ad	35%	15%	20%	19%	6%	0%	6%	0%
	% Ranked as the worst ad	4%	0%	6%	0%	6%	9%	31%	44%

Note. 1. *Cronbach alpha ranges from 0.79 to 0.87 among the 8 ads. 2. Superscript letters denote significant difference at $p < .05$ for paired t-test pairwise comparisons. Ads with the same superscript letter are not significantly different from another.

Table L.2. Results of follow-up telephone survey

Recall	Effectiveness score		Rank	Thought about ad		Talked about ad		Thought ad effective		Tried quitting		Tried quitting b/c ad		
	n	%		n	%	n	%	n	%	n	%	n	%	
First recalled ad	51	100%												
Candle	18	35%	3.73	3	9	50%	4	22%	17	94%	7	39%	5	28%
Oral cancer	15	29%	3.97	1	8	53%	5	33%	15	100%	4	27%	2	13%
Sponge	9	18%	3.70	4	5	56%	3	33%	8	89%	4	44%	3	33%
Artery	5	10%	3.74	2	3	60%	2	40%	2	40%	1	20%	1	20%
COPD	2	4%	3.41	5	2	100%	2	100%	2	100%	0	0%	0	0%
1200 dead	2	4%	3.11	7	0	0%	0	0%	0	0%	0	0%	0	0%
Duo	0	0%	3.35	6										
Smile	0	0%	2.89	8										
Second recalled ad	49	96%												
Candle	13	27%	3.73	3	8	62%	3	23%	12	92%	6	46%	3	23%
Oral cancer	9	18%	3.97	1	4	44%	2	22%	6	67%	3	33%	2	22%
Artery	8	16%	3.74	2	6	75%	4	50%	7	88%	3	38%	1	13%
Sponge	6	12%	3.70	4	2	33%	2	33%	4	67%	2	33%	1	17%
Duo	5	10%	3.35	6	2	40%	1	20%	2	40%	1	20%	0	0%
COPD	3	6%	3.41	5	1	33%	0	0%	1	33%	0	0%	0	0%
1200 dead	3	6%	3.11	7	2	67%	0	0%	1	33%	0	0%	0	0%
Smile	2	4%	2.89 ^e	8	0	0%	0	0%	0	0%	0	0%	0	0%

Third recalled ad	37	73%											
Artery	8	22%	3.74	2	25%	0	0%	7	88%	3	38%	2	25%
Oral cancer	8	22%	3.97	4	50%	0	0%	7	88%	2	25%	0	0%
Candle	6	16%	3.73	3	50%	2	33%	5	83%	1	17%	1	17%
Sponge	6	16%	3.70	1	17%	1	17%	4	67%	1	17%	0	0%
1200 dead	4	11%	3.11	2	50%	2	50%	1	25%	2	50%	1	25%
Duo	2	5%	3.35	2	100%	1	50%	0	0%	1	50%	0	0%
Smile	2	5%	2.89	2	100%	0	0%	0	0%	0	0%	0	0%
COPD	1	3%	3.41	1	100%	1	100%	0	0%	0	0%	0	0%

Table L.3. Comparison of perceived effectiveness (PE) score among ads by quit intention and educational attainment

PE score Mean (sd)		Oral Cancer	Artery	Candle	Sponge	COPD	Duo	1200 Dead	Smile
All		4.0 ^a (0.7)	3.7 ^b (0.7)	3.7 ^b (0.7)	3.7 ^b (0.6)	3.4 ^c (0.8)	3.4 ^c (0.7)	3.1 ^d (0.9)	2.9 ^e (0.8)
Education	High	4.0 ^a (0.7)	3.8 ^b (0.7)	3.7 ^b (0.8)	3.8 ^b (0.7)	3.4 ^c (0.8)	3.3 ^c (0.8)	3.0 ^{cd} (0.9)	2.9 ^d (0.9)
	Low	3.9 ^a (0.6)	3.7 ^{ab} (0.6)	3.8 ^{ab} (0.7)	3.6 ^b (0.5)	3.3 ^c (0.6)	3.5 ^c (0.5)	3.2 ^{cd} (0.9)	2.9 ^d (0.7)
Quit intention	Yes	4.0 ^a (0.6)	3.8 ^a (0.8)	3.9 ^a (0.7)	3.8 ^a (0.7)	3.4 ^b (0.8)	3.3 ^b (0.8)	3.3 ^b (0.9)	2.9 ^c (0.7)
	No	3.9 ^a (0.7)	3.6 ^b (0.6)	3.7 ^b (0.7)	3.6 ^b (0.6)	3.4 ^b (0.7)	3.4 ^b (0.7)	2.9 ^c (0.9)	2.9 ^c (0.9)

Note. Superscript letters denote significant difference at $p < .05$ for paired t-test pairwise comparisons. Ads with the same superscript letter are not significantly different from another.

Table L.4 Ad ratings on perceived effectiveness and other individual measures

Ad ratings and exposure	Oral Cancer	Artery	Candle	Sponge	COPD	Duo	1200 Dead	Smile
Percent / Mean (sd)								
Prior exposure	0.0%	3.7%	0.0%	68.5%	44.4%	35.2%	0.0%	1.9%
Perceived Effectiveness Scale	4.0 ^a (0.7)	3.7 ^{ab} (0.7)	3.7 ^{ab} (0.7)	3.7 ^{ab} (0.6)	3.4 ^{bc} (0.8)	3.4 ^{bc} (0.7)	3.1 ^{cd} (0.9)	2.9 ^d (0.8)
Easy to understand	4.5 ^a (0.7)	4.2 ^{ab} (0.7)	4.1 ^{ab} (0.9)	4.5 ^a (0.5)	4.1 ^{ab} (0.9)	4.3 ^{ab} (0.7)	3.9 ^b (1.0)	4.0 ^b (0.9)
Teaches me something new	3.7 ^a (0.9)	3.9 ^a (0.9)	3.1 ^{bc} (1.0)	3.7 ^a (0.8)	3.8 ^a (1.1)	3.4 ^{ab} (0.9)	3.4 ^b (1.2)	2.6 ^c (1.0)
Believable	4.1 ^a (0.9)	3.7 ^{abc} (0.8)	3.9 ^{ab} (0.9)	3.8 ^{ab} (1.0)	4.0 ^{ab} (0.8)	4.0 ^{ab} (0.9)	3.5 ^{bc} (1.0)	3.2 ^c (1.0)
Make me feel uncomfortable	4.4 ^a (0.8)	3.6 ^{bc} (0.9)	4.0 ^{ab} (0.8)	3.2 ^c (1.1)	2.4 ^d (1.1)	2.5 ^d (1.0)	2.4 ^d (0.9)	2.3 ^d (0.9)
Speaks to people like me	3.5 ^a (1.0)	3.4 ^{ab} (0.9)	3.5 ^a (1.0)	3.4 ^a (0.9)	3.1 ^{ab} (1.0)	2.9 ^{ab} (0.9)	3.2 ^b (1.0)	2.9 ^{ab} (1.0)

Note. 1. *Cronbach alpha ranges from 0.79 to 0.87 among the 8 ads. 2. Superscript letters denote significant difference at $p < .05$ for Tukey HSD pairwise comparisons. Ads with the same superscript letter are not significantly different from another.

Table L.5. Comparison of perceived effectiveness (PE) score among ads by quit intention and educational attainment

PE score Mean (sd)		Oral Cancer	Artery	Candle	Sponge	COPD	Duo	1200 Dead	Smile
All		4.0 ^a (0.7)	3.7 ^{ab} (0.7)	3.7 ^{ab} (0.7)	3.7 ^{ab} (0.6)	3.4 ^{bc} (0.8)	3.4 ^{bc} (0.7)	3.1 ^{cd} (0.9)	2.9 ^d (0.8)
Education	High	4.0 ^a (0.7)	3.8 ^{ab} (0.7)	3.7 ^{ab} (0.8)	3.8 ^{ab} (0.7)	3.4 ^{bc} (0.8)	3.3 ^{bc} (0.8)	3.0 ^{cd} (0.9)	2.9 ^{cd} (0.9)
	Low	3.9 ^a (0.6)	3.7 ^{ab} (0.6)	3.8 ^{abc} (0.7)	3.6 ^{abc} (0.5)	3.3 ^{bcd} (0.6)	3.5 ^{cd} (0.5)	3.2 ^{de} (0.9)	2.9 ^e (0.7)
Quit intention	Yes	4.0 ^a (0.6)	3.8 ^{ab} (0.8)	3.9 ^{ab} (0.7)	3.8 ^{ab} (0.7)	3.4 ^{bc} (0.8)	3.3 ^{bc} (0.8)	3.3 ^{cd} (0.9)	2.9 ^d (0.7)
	No	3.9 ^a (0.7)	3.6 ^{ab} (0.6)	3.7 ^{ab} (0.7)	3.6 ^{ab} (0.6)	3.4 ^{bc} (0.7)	3.4 ^{bc} (0.7)	2.9 ^{cd} (0.9)	2.9 ^d (0.9)

Note. Superscript letters denote significant difference at $p < .05$ for Tukey HSD pairwise comparisons. Ads with the same superscript letter are not significantly different from another.

Table L.6. Comparison of perceived effectiveness (PE) score among smokers by quit intention and educational attainment

PE rating	Quit intention			Education		
	Yes	No	pval	High	Low	pval
Oral cancer	4.03	3.91	0.523	4.02	3.89	0.458
Candle	3.88	3.59	0.132	3.72	3.74	0.916
Artery	3.86	3.64	0.235	3.76	3.71	0.801
Sponge	3.85	3.56	0.089	3.78	3.58	0.280
COPD	3.47	3.35	0.568	3.44	3.36	0.728
1200 dead	3.31	2.94	0.116	3.05	3.22	0.486
Duo	3.30	3.40	0.627	3.27	3.49	0.297
Smile	2.93	2.85	0.730	2.87	2.91	0.843
Average rating	3.59	3.40	0.181	3.50	3.49	0.956

Note. Independent samples t-test were conducted to compare PE ratings between smokers with quit intention and smokers without quit intention as well as between smokers with high educational attainment and smokers with low educational attainment.