# Comparing the Experience of Regret and Its Predictors Among Smokers in Four Asian Countries: Findings From the ITC Surveys in Thailand, South Korea, Malaysia, and China

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## ABSTRACT

**Introduction:** Nearly all smokers in high-income Western countries report that they regret smoking (Fong, G. T., Hammond, D., Laux, F. L., Zanna, M. P., Cummings, M. K., Borland, R., & Ross, H. [2004]. The near-universal experience of regret among smokers in four countries: Findings from the International Tobacco Control Policy Evaluation Survey. *Nicotine and Tobacco Research, 6*, S341–S351. doi:10.1080/14622200412331320743), but no research to date has examined the prevalence of regret among smokers in non-Western, low- and middle-income countries.

**Methods:** Data were from the International Tobacco Control (ITC) Surveys of smokers in 4 Asian countries (China, Malaysia, South Korea, and Thailand); $N = 9{,}738$. Regret was measured with the statement: "If you had to do it over again, you would not have started smoking."

**Results:** Prevalence of regret in 3 countries (South Korea = 87%, Malaysia = 77%, and China = 74%) was lower than that found by Fong et al. in the United States, Australia, Canada, and the United Kingdom (89%–90%); but was higher in Thailand (93%). These significant country differences in regret corresponded with differences in tobacco control and norms regarding smoking. The predictors of regret in the Asian countries were very similar to those in the 4 Western countries: Regret was more likely to be experienced by smokers who smoked fewer cigarettes per day, perceived greater benefits of quitting and higher financial costs of smoking, had more prior quit attempts, worried that smoking would damage their health, and felt that their loved ones and society disapproved of smoking. Regret was also positively associated with intentions to quit ($r = 0.23$, $p < .001$).

**Conclusions:** Across the Asian countries and high-income Western countries, the prevalence of regret varies, but the factors predicting regret are quite consistent. Regret may be an important indicator of tobacco control and is related to factors associated with future quitting.

Although the tobacco industry has argued that smokers are fully aware of the risks of smoking when they decide to smoke, evidence that the majority of smokers want to quit and regret having started smoking suggest that this is not the case (Fong et al., 2004; Slovic, 2001). Smokers' experience of regret may have important implications for their beliefs and behavior, but the few studies conducted so far on regret among smokers have

all been in high-income countries. Results from the Annenberg telephone survey, a nationally representative survey of adult and youth in the United States, found that more than 85% of adult smokers and about 80% of young smokers said that if they had to do it again, they would not start smoking (Slovic, 2001). More recently, Conner et al. (2006) examined the role of anticipated regret in the initiation of smoking among youth in

the United Kingdom. The researchers found that the more the non-smoking youth expected they would regret smoking, the less likely they were to intend to smoke.

The first study to document the prevalence of regret at the international level was conducted among large representative samples of adult smokers in four high-income countries: Canada, United States, Australia, and United Kingdom. In this study, Fong et al. (2004) analyzed data from the International Tobacco Control (ITC) Four Country Survey and found that about 90% of smokers expressed regret over their smoking, using the same measure as in the Slovic study. In addition, both the prevalence of regret and the factors that predicted regret were essentially identical across the four countries. Fong et al. suggested that regret may be a "near-universal" experience among smokers, and also suggested that regret may have implications for smoking cessation, as evidenced by the positive correlation ($r = +0.24$) between regret and intentions to quit.

In a more recent analysis of data from the ITC Southeast Asia Survey, Lee et al. (2009) found that a significantly greater proportion of Thai smokers expressed regret over their smoking compared with Malaysian smokers, and that Thai smokers were also more likely to intend to quit. The authors suggested that tobacco control policies in these countries shape smokers' feelings of regret, which in turn can influence their intentions to quit smoking.

The high levels of regret seen among smokers in ITC data present a challenge for tobacco industry arguments that the public is fully informed of the risks of smoking, an argument they use to try to resist tobacco control measures such as health warnings or to protect themselves from litigation (Chapman & Liberman, 2005). As Chapman and Liberman (2005) have suggested, a "fully informed smoker" would mean that the smoker is not only aware of the health risks of smoking but also understands the specific diseases caused by smoking and the probability of developing such diseases, and accepts their own personal risk of contracting these diseases, a level of awareness that many smokers do not have.

The fact that so many smokers regret their decision to start not only threatens tobacco industry arguments but also challenges economic models of rational choice. Traditional rational addiction models, as typically used in policy analysis, assume that when a smoker first decides to smoke, they make a rational choice taking into account all possible consequences of their action, and their preferences will remain stable over time (e.g., Becker & Murphy, 1988). The assumptions that preferences are stable and that consumers discount the future consequences of their decisions exponentially imply that, for example, although a 40-year-old may prefer not to be a smoker, his 17-year-old self will have properly accounted for the best interests of his 40-year-old self when deciding whether or not to smoke.

The extremely high and consistent prevalence of regret among smokers in Fong et al. (2004) suggests, however, that preferences are not stable and/or that consumers do not discount future welfare consequences exponentially. Although models of rational choice and the phenomenon of regret are not necessarily incompatible, alternative models that allow for time-inconsistent behavior and preferences are more consistent with the high prevalence of regret found among smokers.

The Fong et al. (2004) study demonstrates the usefulness of regret as an important measure of overall disposition toward smoking, as well as the linkage between regret and intentions to quit smoking. But more broadly speaking, regret may serve as an indicator of overall societal norms and social approval or disapproval about smoking. In countries where tobacco control programs are strong and societal norms toward smoking are highly negative, regret should be strong and prevalent among smokers. But in countries where tobacco control is weak and where societal norms are less negative toward smoking, regret should be less prevalent. This would explain why the original regret study of Fong et al. involving four high-income countries with very strong, world-leading tobacco control programs and policies found "near universality" of regret among smokers, and also why it would be necessary to test the hypothesis about the relation between the strength of tobacco control programs and policies and regret among a set of countries where there was greater variability of the strength of tobacco control.

This study was conducted among four Asian countries—Thailand, Malaysia, South Korea, and China—which, unlike the four high-income nations from the study of Fong et al., vary considerably in terms of their smoking prevalence, strength of tobacco control policies, and societal norms and attitudes toward smoking. Thailand is considered to be a leader in tobacco control in Asia and throughout the world (Lee et al., 2009), whereas China is one of the world's largest producers and consumers of cigarettes, with very weak tobacco control policies (World Health Organization, 2010; Yang et al., 1999). South Korea had implemented many tobacco control policies by the time of the Wave 1 survey, but they were not highly effective (Kang, Kim, & Park, 2003). Whereas Malaysia has recently stepped up its tobacco control efforts, at the time of data collection, their efforts were fairly weak and not well enforced (Lee et al., 2009; Yong et al., 2009). More detailed descriptions of the tobacco control policies and smoking prevalence at the time of our survey in each country can be found in Table 1. Based on these factors, Thailand and Korea could be considered as having stronger tobacco control climates than Malaysia and China.

The first objective of this study was to measure the prevalence of regret in each of these four Asian countries, in order to determine if levels of regret differ across countries and if they differ in accordance with the strength of a country's tobacco control policies. The second objective was to identify the factors that predict the experience of regret in each country, and to determine if these factors are consistent or variable across the four countries. The third objective was to compare both the levels of regret and its predictors in Asia to those that were found in study of Fong et al.(2004) in the four developed nations, in order to form a clearer understanding of the nature of regret across very different countries.

## METHODS

### Data Source and Participants

The data for this study were from the International Tobacco Control (ITC) Policy Evaluation Surveys in four countries: Thailand, Malaysia, South Korea, and China. The ITC Project consists of cohort surveys of tobacco use and policy evaluation in more than 20 countries around the world, all following the same conceptual framework and rigorous methodology to allow for comparisons across countries.

**Table 1.** Smoking Prevalence and Tobacco Control Policies at Time of Data Collection

|  | Thailand (2005) | South Korea (2005) | Malaysia (2005) | China (2006) |
|---|---|---|---|---|
| Male smoking prevalence[a] | 43% | 53% | 53% | 59% |
| Female smoking prevalence[a] | 2% | 6% | 3% | 4% |
| Tobacco control policies at time of Wave 1 Survey[b] | Pictorial health warnings | Text-only health warnings | Text-only health warnings | Text-only health warnings, on the side of the pack |
|  | Ban on misleading descriptors | No ban on misleading descriptors | No ban on misleading descriptors | No ban on misleading descriptors |
|  | Complete smoking ban in workplaces and restaurants | Many areas smoke-free but designated smoking areas allowed | Some smoking restrictions but not comprehensive | Weak smoke-free laws |
|  | Ban on tobacco advertising (except international), promotion, and sponsorship | Most forms of tobacco advertising banned | Most forms of tobacco advertising banned | Direct tobacco advertising banned but promotion and sponsorship permitted |
|  | Strong antismoking campaigns | Strong antismoking campaigns | Some antismoking campaigns | Few antismoking campaigns |
|  | Taxes 79% of retail price | Taxes 54% of retail price | Taxes 39% of retail price | Taxes 21% of retail price |

*Notes.* [a]Age-standardized adult prevalence estimates for 2006, according to the World Health Organization (2009) Global Tobacco Control Report.
[b]Taxes are total excise tax as a percentage of retail price, according to the World Health Organization (2008) MPOWER Report.

Participants were adult regular smokers who were aged 18 or older (19 or older in Korea in line with the age of majority), reported having smoked at least 100 cigarettes in their lifetime, and currently smoked at least weekly (or at least monthly in Korea). The weekly versus monthly smoking criteria varied across countries to match national health surveys, and all smokers were asked about their smoking frequency in the surveys. The sample sizes for smokers in each country were as follows: Thailand, $n = 2,000$; Malaysia, $n = 2,004$; South Korea, $n = 1,002$; China, $n = 4,815$. We used data from the first wave of the survey in each of the four countries (January to March 2005 in Thailand and Malaysia, November to December 2005 in Korea, and April to August 2006 in China). All surveys were conducted face-to-face except in Korea, where they were conducted by telephone. Further details on the survey design and methods in each country, as well as surveys themselves, can be found in Fong et al. (2006) and at http://www.itcproject.org.

**Ethical Clearance**

The survey protocol was cleared for ethics by the research ethics boards at the University of Waterloo and the Cancer Council Victoria, and by the institutional review boards at Mahidol University, the Universiti Sains Malaysia, the U.S. National Cancer Institute, the National Cancer Center of Korea, and the China National Center for Disease Control and Prevention.

**Measures**

*Demographic Measures*
Demographic variables included in the analyses were gender, age, urban or rural status, education, and income. Income was a measure of the respondent's combined average household income for 1 year, which we recoded into three categories. Education was a measure of the highest level of formal education that the respondent had completed, which was recoded into two categories.

*Regret*
To measure regret, smokers were asked the extent to which they agreed with the statement, "If you had to do it over again, you would not have started smoking." This measure, taken from the Annenberg Surveys described in Slovic (2001), fits into rational choice frameworks of replicability and consistency of choice. We dichotomized this variable so that those who responded with "Agree" or "Strongly agree" were classified as having regret, and those who responded with "Strongly disagree," "Disagree," and "Neither disagree nor agree" were classified as having no regret for smoking.

*Predictor Variables*
Smoking-related variables included number of cigarettes smoked per day, whether respondents had ever smoked light cigarettes, and two measures of addiction: perceived addiction ("Do you consider yourself addicted to cigarettes?") and time until your first cigarette of the day.

Quitting-related variables included number of past quit attempts, and perceived benefits of quitting, measured by the question, "How much do you think you would benefit from health and other gains if you were to quit smoking permanently in the next 6 months?"

We included two measures related to health. An overall self-rating of health was measured by the question, "In general, how would you describe your health?", and concern for future health was measured with "How worried are you, if at all, that smoking will damage your health in the future?"

There was one measure of financial cost, which asked respondents to indicate the extent of their agreement or disagreement with the statement, "You spend too much money on cigarettes."

We included two measures of social norms: perceptions of society and perceptions of close others. Societal norms were measured by respondents' agreement or disagreement with the statement, "Society disapproves of smoking," and perceptions of close others was measured by the statement, "People who are important to you believe you should not smoke."

*Intention to Quit*

Smokers' intentions to quit were dichotomized into two categories. Those who reported planning to quit in the next month or 6 months were classified as having an intention to quit, and those who reported planning to quit beyond 6 months or not at all were classified as not intending to quit.

### Data Analysis

We conducted logistic regression analyses with the four countries combined, but included interaction effects in the model to evaluate any differences in the predictors of regret across countries. All analyses were conducted using IBM SPSS Statistics 19 for Windows. Survey weights were constructed for each country to account for the varying inclusion probabilities of individuals, and all analyses were conducted using weighted data.

## RESULTS

### Characteristics of the Sample

Table 2 presents the weighted sample characteristics for the respondents from each country who were included in the analyses.

### Differences in Social Norms

Two measures were used to assess the social norms toward smoking in each country: the perception that society disapproves of smoking and the perception that "people close to you don't want you to smoke." Korean smokers were most likely to believe that society disapproves of smoking (86.2%), followed by Thailand (77.7%), China (59.5%), and Malaysia (29.8%), all of which were significantly different.

Thailand had the highest perceptions that close others disapprove of one's smoking (90.4%), followed by Korea (89.4%), Malaysia (82.4%), and China (76.8%), although Thailand and Korea did not significantly differ from each other. This generally corresponds to the tobacco control climate in each country, with Thailand and Korea having stronger policies and social norms against smoking compared with Malaysia and China.

### Prevalence of Regret

Unlike the four Western countries, the four Asian countries differed from each other in the overall prevalence of regret among smokers. Smokers in Thailand reported the highest level of regret, with 92.6% of smokers agreeing with the statement, "If you had to do it over again, you would not have started smoking." Korea had the second highest prevalence of regret at 86.5%, followed by Malaysia at 77.1%, and finally China at 74.3%. The overall chi-square test of these prevalence levels was significant ($\chi^2(3, N = 9,322) = 325.9, p < .001$), and each of the pairwise differences between countries was also significant, demonstrating that the proportions of regret in the four countries were all significantly different from each other.

### Logistic Regression Analyses

We conducted logistic regression analyses using the entire sample of four countries, with the dichotomized regret variable as the dependent variable. The first regression model contained all of the predictor variables of interest, including a country variable to determine if country was a significant determinant of regret beyond the individual predictors. This variable was dummy coded with China as the baseline country. A second regression model contained the predictors followed by all product terms formed by crossing the country dummy variable with each of the predictor variables, allowing us to determine if any of the predictors of regret varied across the four countries.

The results of the weighted logistic regression model predicting regret are displayed in Table 3, which displays the odds ratios (*OR*s) for each of the independent variables, adjusting for the other variables in the model. The addition of the product terms as predictors in the model resulted in only two significant

**Table 2.**  Weighted Sample Characteristics for Each Country

| Characteristic | All countries | Thailand | Malaysia | South Korea | China |
|---|---|---|---|---|---|
| Total number of respondents | 9,738 | 2,000 | 2,004 | 1,002 | 4,732 |
| Number of respondents with non-missing values on all variables included in the analyses | 6,887 | 1,819 | 946 | 909 | 3,213 |
| Gender (percent male) | 95.4 | 94.5 | 94.5 | 96.2 | 95.9 |
| Age | | | | | |
| 18–24 years (percent) | 6.8 | 6.7 | 16.3 | 13.2 | 1.6 |
| 25–39 years (percent) | 24.5 | 24.1 | 32.9 | 42.7 | 17.4 |
| 40–54 years (percent) | 40.7 | 41.3 | 31.0 | 28.7 | 47.0 |
| 55+ years (percent) | 27.9 | 27.8 | 19.9 | 15.4 | 34.0 |
| Mean age (years) | 46.7 | 46.6 | 40.9 | 39.4 | 50.7 |
| Urban/rural status (percent urban) | 76.7 | 26.4 | 60.1 | 100.0 | 100.0 |
| Education (percent secondary school or above) | 47.5 | 14.2 | 47.1 | 85.5 | 53.7 |
| Income (percent in highest income category) | 33.6 | 29.5 | 34.4 | 56.7 | 30.3 |
| Percent who regret smoking | 80.1 | 92.6 | 77.1 | 86.5 | 74.3 |
| Percent who plan to quit within 6 months | 18.3 | 21.1 | 11.8 | 42.3 | 14.7 |

**Table 3.** Weighted Logistic Regression Analysis of Regret

| Predictor | Percent who regret[a] | N who regret | Adjusted odds ratio (95% CI) | p value |
|---|---|---|---|---|
| Demographic variables | | | | |
|   Gender | | | | |
|     Male | 80.0% | 7,093 | 1.00 (reference) | |
|     Female | 80.6% | 348 | 1.18 (0.80–1.76) | .402 |
|   Age (years) | | | | |
|     18–24 | 80.8% | 496 | 1.00 (reference) | |
|     25–39 | 80.5% | 1,841 | 0.88 (0.62–1.25) | .477 |
|     40–54 | 79.8% | 3,020 | 1.24 (0.87–1.76) | .230 |
|     55+ | 79.7% | 114 | 1.49 (0.99–2.26) | .058 |
|   Urban/rural status | | | | |
|     Rural | 87.9% | 1,856 | 1.00 (reference) | |
|     Urban | 77.7% | 5,584 | 1.11 (0.56–2.20) | .758 |
|   Education | | | | |
|     Completed less than secondary school | 80.4% | 3,884 | 1.00 (reference) | |
|     Completed secondary school or more | 79.7% | 3,512 | 1.21 (0.94–1.55) | .130 |
|   Income | | | | |
|     Low | 81.6% | 2,073 | 1.00 (reference) | |
|     Medium | 80.9% | 2,634 | 0.96 (0.78–1.19) | .569 |
|     High | 79.3% | 2,364 | 0.90 (0.70–1.16) | .411 |
|   Country | | | | |
|     China | 74.3% | 3,394 | 1.00 (reference) | |
|     Malaysia | 77.1% | 1,337 | 1.11 (0.70–1.77) | .657 |
|     South Korea | 86.5% | 867 | 0.99 (0.97–3.00) | .972 |
|     Thailand | 92.6% | 1,843 | 1.71 (1.42–2.73) | .062 |
| Smoking- and quitting-related variables | | | | |
|   Cigarettes smoked per day | | | 0.83 (0.74–0.92) | .001 |
| | | | (continuous) | |
|     1–10 | 82.3% | 3,109 | | |
|     11–20 | 80.0% | 3,453 | | |
|     21–30 | 76.9% | 488 | | |
|     31+ | 68.4% | 355 | | |
|   Time after waking until first cigarette | | | 1.00 (0.91–1.12) | .904 |
| | | | (continuous) | |
|     Within 5 min | 78.3% | 1,942 | | |
|     6–30 min | 82.4% | 1,897 | | |
|     31–60 min | 80.1% | 2,692 | | |
|     More than 60 min | 81.1% | 577 | | |
|   Perceived addiction: Do you consider yourself addicted to cigarettes? | | | 1.11 (0.92–1.34) (continuous) | .268 |
|     Not at all | 77.3% | 1,004 | | |
|     Somewhat | 79.2% | 4,607 | | |
|     Very | 84.2% | 1,748 | | |
|   Number of prior quit attempts | | | 1.26 (1.14–1.40) | <.001 |
| | | | (continuous) | |
|     Never | 70.0% | 2,409 | | |
|     Once | 82.0% | 1,230 | | |
|     2–5 times | 88.1% | 2,781 | | |
|     6–10 times | 86.8% | 336 | | |
|     More than 10 times | 86.1% | 508 | | |
|   Perceived benefits of quitting: How much do you think you would benefit from health and other gains if you were to quit smoking permanently in the next 6 months | | | 1.59 (1.38–1.84) (continuous) | <.001 |
|     Not at all | 56.5% | 587 | | |
|     Somewhat | 76.6% | 2,222 | | |
|     Very much | 90.4% | 4,143 | | |
| Smoker of "light" cigarettes | | | | |
|     Never smoked light cigarettes | 76.9% | 3,262 | 1.00 (reference) | .798 |
|     Have or currently smoke light cigarettes | 82.7% | 4,075 | 1.02 (0.86–1.22) | |

(*Continued*)

**Table 3.** Continued

| Predictor | Percent who regret[a] | N who regret | Adjusted odds ratio (95% CI) | p value |
|---|---|---|---|---|
| Health-relevant variables | | | | |
| Overall self-rating of health: In general, how would you describe your health | | | 1.08 (0.98–1.19) (continuous) | .087 |
| Excellent | 66.3% | 457 | | |
| Very good | 76.9% | 1,250 | | |
| Good | 78.6% | 3,491 | | |
| Fair | 88.2% | 1,710 | | |
| Poor | 90.1% | 522 | | |
| Worry that smoking will damage health: How worried are you, if at all, that smoking will damage your health in the future | | | 1.65 (1.42–1.91) (continuous) | <.001 |
| Not at all | 61.5% | 1,188 | | |
| Somewhat | 82.8% | 3,555 | | |
| Very much | 92.3% | 2,449 | | |
| Perceived financial cost | | | | |
| Perceived financial cost: You spend too much money on cigarettes | | | 1.31 (1.19–1.45) (continuous) | <.001 |
| Strongly disagree | 74.0% | 143 | | |
| Disagree | 71.9% | 1,126 | | |
| Neither agree nor disagree | 65.0% | 546 | | |
| Agree | 82.7% | 4,371 | | |
| Strongly agree | 90.1% | 1,173 | | |
| Perceived social norms | | | | |
| Society disapproves of smoking | | | 1.35 (1.14–1.59) (continuous) | <.001 |
| Disagree | 76.1% | 1123 | | |
| Neither | 66.3% | 1289 | | |
| Agree | 86.6% | 4766 | | |
| Subjective norms: People who are important to you believe you should not smoke | | | 1.62 (1.45–1.80) (continuous) | <.001 |
| Strongly disagree | 67.3% | 45 | | |
| Disagree | 56.2% | 498 | | |
| Neither agree nor disagree | 51.5% | 342 | | |
| Agree | 83.4% | 4,656 | | |
| Strongly agree | 91.9% | 1,807 | | |

*Note.* China, $N = 3,213$; Malaysia, $N = 946$; South Korea, $N = 909$; Thailand $N = 1,819$; CI = confidence interval.
[a]The regret prevalences presented in this table are not adjusted for other predictors in the model.

interactions between country and the predictor variables: the products of country by age group (Wald statistic = 2.84, $p < .01$) and perceived financial cost (Wald statistic = 4.88, $p < .01$). However, the Bonferroni adjustment for multiple comparisons rendered these both nonsignificant. This result supports the conclusion that the predictors of regret and the strength of the predictive relationship did not differ across the four Asian countries. This is a very strong conclusion because the statistical power arising from having a sample size of nearly 7,000 for each of the statistical tests was extremely high.

**Predictors of Regret**

*Demographic Measures*
None of the five demographic variables included in the analysis (gender, age, urban/rural, education, and income) were significant predictors of regret.

*Smoking- and Quitting-Relevant Variables*
Cigarettes per day was a significant predictor of regret, with those who smoked more cigarettes in a day being less likely

to experience regret ($OR = 0.83$, $p < .01$). However, being a smoker of light or mild cigarettes did not seem to have an effect on regret among Asian smokers ($p = .80$). Interestingly, neither of the addiction variables was significantly related to regret. Smokers who perceived themselves to be addicted and smoked their first cigarette earlier in the day were no more likely to experience regret than those who reported less signs of addiction ($p = .27$ and $p = .90$, respectively). Both of the quitting-related variables were significantly related to regret: smokers who had made more quit attempts in the past were more likely to experience regret than those who had fewer prior quit attempts ($OR = 1.26$, $p < .001$), and those who perceived greater benefits from quitting were more likely to regret smoking compared with those who did not expect such benefits ($OR = 1.59$, $p < .001$).

*Health-Relevant Variables*
Of the two health-related variables (self-rating of health and concern for future health), only one was significantly related to regret. Smokers who were more worried about the damage

that smoking would have on their health in the future were significantly more likely to regret smoking than those who were less worried about their future health ($OR = 1.65$, $p < .001$). Smokers who rated themselves in worse overall health were also more likely to regret smoking than those who perceived themselves to be in better health, but this relationship failed to reach significance ($p = .09$).

*Perceived Financial Cost*
Smokers who reported that they spend too much money on cigarettes were significantly more likely to regret smoking compared with those who did not report a high financial cost of smoking ($OR = 1.31$, $p < .001$).

*Perceived Social Norms About Smoking*
Both measures of social norms were significant predictors of regret. Regret was more likely to be experienced by smokers who perceived that society disapproved of smoking ($OR = 1.35$, $p < .001$) and that close others did not want them to smoke ($OR = 1.62$, $p < .001$) compared with those who did not perceive such negative social norms toward smoking.

**Relation of Regret to Quit Intentions**

As displayed in Table 2, South Korean smokers had the highest intention to quit (42.3%) of the four countries, followed by Thailand, China, and Malaysia, and all differences between countries were significant ($\chi^2(2, N = 9,677) = 492.21$, $p < .001$). Across the entire sample, regret was positively correlated with stronger intentions to quit (when both variables were maintained in their original 5-point scale), $r = 0.23$, $p < .001$. Regret was also significantly correlated with quit intentions within each of the four countries, with the strongest association in China ($r = 0.233$, $p < .001$), followed by Korea ($r = 0.201$, $p < .001$), Malaysia ($r = 0.162$, $p < .001$), and Thailand ($r = 0.057$, $p < .05$).

We conducted a logistic regression analysis where regret (in its original 5-point scale) was used to predict smokers' intentions to quit (dichotomized into quit intention vs. no quit intention). The results revealed that respondents who expressed more regret for smoking were significantly more likely to plan to quit within the next 6 months ($OR = 1.87$, $p < .001$). This relationship held true when we used the dichotomous regret variable instead of the scaled variable as a predictor in logistic regression, and when we used the scaled versions of each question in a linear regression analysis.

## DISCUSSION

This study explored the experience of regret among smokers from large, nationally representative samples in four Asian countries: Thailand, Malaysia, South Korea, and China. The results demonstrated that these countries differed both from each other and from the four Western nations in the study of Fong et al. (2004) in terms of the overall prevalence of regret among smokers. This supports the importance of regret as being responsive across countries to the strength of tobacco control programs, policies, and norms toward tobacco use. Thailand had the highest level of regret, followed by South Korea, Malaysia, and lastly China, which generally corresponded to

the strength of tobacco control and level of smoking prevalence across the four countries. However, the individual factors that predicted regret were mostly consistent across this diverse set of Asian countries and were also nearly identical to the predictors that were found in the Western countries. This suggests that regret is an individually experienced emotion largely determined by one's smoking behavior and beliefs, but is also influenced by the overall tobacco control climate of a country.

The findings from this cross-country study provide a depiction of regretful smokers in Asia. Regretful smokers feel worried about the future health consequences of smoking, and they are also concerned about the financial consequences of smoking: smokers who feel that they spend too much money on cigarettes are more likely to say that they would not start smoking if they could do it again. Regretful smokers in Asia are also sensitive to social norms regarding smoking. Those who feel that people close to them do not want them to smoke and that the society they live in disapproves of smoking are more likely to feel regret. Not surprisingly, regretful Asian smokers are also those who have made more attempts to quit in the past and perceive greater benefits from quitting smoking. The directionality of these relationships is something that will need to be explored in future studies. In addition, the finding that regretful smokers were those who smoked fewer cigarettes per day deserves attention in future studies; it is possible that addicted smokers who cannot quit but recognize their poor health and regret smoking begin smoking less per day, but this would require longitudinal research.

Not only were these predictors of regret mostly consistent across the four Asian countries, but they were also highly consistent with the predictors from the four Western nations (see Table 4). Of the 15 variables that were entered in the regression model in both studies, five were found to be significant predictors of regret in both studies, three were found to have no effect on regret in either study, and six variables produced *OR*s in the same direction, but in one study this relationship failed to reach significance. Only one of the 15 predictor variables (education) produced *OR*s in different directions in the two studies: In the study of Fong et al., smokers with the highest level of education were significantly less likely to regret smoking compared with those with the lowest level of education, whereas education was not a significant predictor of regret in our study (but the *OR* indicated that those with higher education were slightly more likely to regret). The reason for this difference is unclear, although it is somewhat difficult to compare the two studies on this variable as we had only two categories of education in our study compared with three. As the majority of the predictors were the same across all countries, this suggests that individual smoker experience of regret is strongly associated with his or her smoking behavior and attitudes toward smoking across a range of populations.

An equally important finding of this study is that the overall prevalence of regret was not consistent across countries, but appeared to correspond with the overall strength of tobacco control in each country. We are limited in some of our conclusions by the fact that there is no readily available measure of tobacco control that we can directly link to regret in order to statistically evaluate if indeed greater tobacco control efforts can lead to greater regret. Instead, we rated the countries based on extensive knowledge from the ITC Project and other sources that have evaluated the public's attitudes toward smoking and the government's introduction and enforcement of various

**Table 4.** Comparison of Predictors of Regret in Western Countries Versus Asian Countries

| Predictor variable from regression model | United States, United Kingdom, Canada, and Australia (Fong et al., 2004) | Thailand, Malaysia, South Korea, and China |
|---|---|---|
| *OR*s in same direction, significant in both studies | | |
| Number of prior quit attempts (higher) | *OR* = 1.41, *p* < .001 | *OR* = 1.26, *p* < .001 |
| Perceived benefits of quitting (higher) | *OR* = 1.90, *p* < .001 | *OR* = 1.59, *p* < .001 |
| Worry that smoking will damage health (higher) | *OR* = 1.50, *p* < .001 | *OR* = 1.65, *p* < .001 |
| Perceived financial cost (higher) | *OR* = 1.41, *p* < .001 | *OR* = 1.31, *p* < .001 |
| Subjective norms: People important to you believe you shouldn't smoke (higher) | *OR* = 1.29, *p* < .001 | *OR* = 1.62, *p* < .001 |
| *OR*s not significant in both studies | | |
| Income (high) | *OR* = 0.90, *p* = .361 | *OR* = 0.90, *p* = .411 |
| Time after waking until first cigarette (higher) | *OR* = 1.00 | *OR* = 1.00, *p* = .904 |
| Overall self-rating of health (higher) | *OR* = 0.99, *p* = .765 | *OR* = 1.08, *p* = .087 |
| *OR*s in same direction, but only significant in one study | | |
| Gender (male) | *OR* = 1.33, *p* = .002 | *OR* = 1.18, *p* = .402 |
| Age (55+) | *OR* = 1.53, *p* = .007 | *OR* = 1.49, *p* = .058 |
| Perceived addiction (higher) | *OR* = 1.73, *p* < .001 | *OR* = 1.11, *p* = .268 |
| Smoker of "light" cigarettes (yes) | *OR* = 1.28, *p* = .005 | *OR* = 1.02, *p* = .798 |
| Society disapproves of smoking (higher) | *OR* = 1.09, *p* = .088 | *OR* = 1.35, *p* < .001 |
| Cigarettes smoked per day (higher) | *OR* = 0.99, *p* = .080 | *OR* = 0.83, *p* = .001 |
| *OR*s in different directions | | |
| Education (high) | *OR* = 0.60, *p* < .001 | *OR* = 1.23, *p* = .130 |
| Incomparable (variables not present in all surveys) | | |
| Ethnicity (non-white) | *OR* = 0.89, *p* = .356 | n/a |
| Urban | n/a | *OR* = 1.11, *p* = .758 |
| Perception that smoking has already damaged health (higher) | *OR* = 0.94, *p* = .616 | n/a |
| Perception that smoking has lowered quality of life (higher) | *OR* = 1.47, *p* = .013 | n/a |
| Perception that smoking will lower future quality of life (higher) | *OR* = 1.37, *p* = .006 | n/a |
| Perception that there are fewer places to smoke (higher) | *OR* = 1.19, *p* < .001 | n/a |

*Note. OR* = odds ratio.

tobacco control policies in each country. Thailand, which has become a leader in global tobacco control efforts, had the highest overall level of regret not only across the four Asian countries but also in comparison with the Western countries from the study of Fong et al.. Korea and Malaysia had relatively less success with tobacco control at the time of the survey, which corresponds with the lower levels of regret found among smokers in these countries. Malaysian smokers had especially low perceptions that society disapproves of smoking; the reasons for this are unclear but may deserve future research, particularly regarding the relationship between perceived societal norms and regret. China, with its overwhelming population of smokers, weak tobacco control policies, and high social acceptability of smoking, not surprisingly had the lowest level of regret among all the countries. These differences in regret suggest that smokers who live in countries with a stronger record of tobacco control and more negative societal norms toward smoking may be more likely to experience regret for smoking. As both Fong et al. (2004) and Lee et al. (2009) have suggested, this may be because it is difficult for smokers to rationalize or justify their smoking in climates of strong tobacco control, so they then feel regret for ever having started smoking.

The high levels of regret among smokers in many countries also support some conclusions that are coming out of literature in economics (see Frederick et al., 2002; Gruber and Koszegi, 2001), that the decisions consumers make over time tend not to be time consistent, as rational choice models would predict. Evidence from eight countries now suggests that this apparent time inconsistency in decision making is resulting in large economic inefficiencies; the majority of smokers around the world agree that, if they could do it again, they would not start smoking. To estimate the magnitude of such inefficiencies requires a model of consumer welfare, and there is currently no accepted alternative to the rational choice framework that assumes away the inefficiencies that would result from hyperbolic discounting or instabilities in consumer preferences across time. We do not, in this article, attempt to propose a scheme, such as welfare weighting across age levels, for how preferences should be aggregated to determine the extent to which sovereign consumers prefer cigarette consumption to quitting, or vice versa. What we highlight, however, is that the extensiveness of the regret we observe does challenge the notion that "consumers wouldn't smoke cigarettes unless it was in their best interests to do so."

Within the rational choice framework, one explanation of regret is that some consumers are not fully informed and may not truly understand the consequences of their decisions when they decide to start smoking. Although they may acknowledge the harms of smoking, they may underestimate their personal risk of harm, or they may believe they will quit before any

harm is done, thus failing to account for the addictive nature of cigarettes (Slovic, 1998). This may be especially true in Asia, where smokers are generally less aware of the risks of smoking and where tobacco advertising and promotion are more prevalent compared with other parts of the world where such marketing is banned (Nakamura, Huxley, Ansary-Moghaddam, & Woodward, 2009; Yong et al., 2008). In these countries, including China, Malaysia, and Korea, it is imperative to improve awareness of the dangers of smoking and the nature of their addictiveness, as well as to change the social acceptance of smoking through tobacco control measures such as media campaigns about the harms of smoking, regulating misleading industry marketing and packaging, and implementing large, pictorial health warnings on tobacco products. This supports Chapman and Liberman's (2005) argument that at the least, countries must establish environments in which smokers are adequately informed as best as possible, and they could even go as far as establishing a licensing system that would require smokers to demonstrate adequate understanding of the risks they face. Not only may these strategies increase the overall level of regret for smoking, but they may also allow youth to make more informed choices when they face the decision of whether or not to start smoking.

A promising finding of this study was that smokers who experienced regret were more likely to plan to quit within the next 6 months. Not only were intentions to quit highest in the two countries with the highest levels of regret (Korea and Thailand), but regret was positively associated with quit intentions in each of the four countries. This suggests that regret may play a role as a mediator of the impact of tobacco control policies on quitting. Longitudinal analyses would be necessary to fully explore the role of regret in quitting, but the variables that were strongly related to regret, such as concern for future damage to health, high financial cost of smoking, and negative social norms about smoking, can all be influenced by strong tobacco control policies. This includes raising taxes on tobacco products in a way that raises the price, implementing and enforcing laws that prohibit public smoking and tobacco advertising and promotion, and promoting media campaigns to educate smokers and change perceptions of smoking, such as China's efforts at anti-gifting campaigns.

This study is the first to explore the psychological experience of regret and its implications using cross-country comparisons of multiple Asian countries. The findings imply that as developing nations begin to improve their tobacco control efforts, smokers may become more aware and accepting of the harms of smoking and regret their decision to smoke, which may not have been a fully informed and rational decision. Because the factors that lead to regret are fairly universal, cessation strategies should target these predictor variables in efforts to increase regret among smokers.

## FUNDING

## DECLARATION OF INTERESTS

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