

Family Influences on Highly-educated Chinese Youths' Smoking Behaviors

Extending the Framework of the Theory of Planned Behavior

by

Xianlin Jin

A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Arts

Approved May 2014 by the
Graduate Supervisory Committee:

Vincent Waldron, Chair
Kyounghee Kwon
Majia Nadesan

ARIZONA STATE UNIVERSITY

August 2014

ABSTRACT

Smoking prevalence has been a significant issue in China. This present study investigates family influences on the smoking behaviors of highly-educated Chinese youths (HECY) and explores whether family factors work as distal factors in the revised framework of the theory of planned behavior. Convenience sampling and snow-ball sampling have been utilized to select participants from highly-educated Chinese youth population who are students studying in colleges or universities and people who recently graduated from Chinese colleges or universities with Bachelor's and/or Master' degrees. This study relies on quantitative methodologies to analyze the data from the participants' responses to online cross sectional surveys with SPSS. This present study has determined that family influences do contribute to the smoking behaviors of highly-educated Chinese youths. In addition to examining the proximal factors (highly-educated Chinese youths' attitudes toward smoking, self-efficacy and social norms of smoking) in the model of the theory of planned behavior, this current study has examined the following distal factors: (1) parental communication about smoking, (2) communication about smoking among siblings, (3) parents, siblings and/or cousins' attitudes toward smoking, and (4) smoking behaviors of parents, siblings and/or cousins.

Keywords: health communication, family influences, highly-educated Chinese youths' smoking behaviors, the theory of planned behavior

ACKNOWLEDGMENTS

The author wishes to acknowledge the chair of her thesis committee, Dr. Vincent Waldron, who served as the mentor and has shared valuable expertise with the author. This mentorship was paramount in providing a well-rounded experience consistent with the author's long-term career goals. The author cordially appreciates the committee members, Dr. Majia Nadesan and Dr. Kyounghee Kwon. Without their support, understanding and patience, this thesis would not be possible. The author owes the gratitude to all of the thesis committee devoting efforts to make this thesis project possible.

TABLE OF CONTENTS

	Page
LIST OF FIGURES.....	vii
CHAPTER	
1. INTRODUCTION.....	1
2 LITERATURE REVIEW	3
Research on Reasons for Youths' Smoking	3
Studies of Chinese Youths' Smoking.....	4
Research on Reasons for Adolescents' Smoking	4
Studies on Chinese Adolescents Smoking Issues	5
Family Influences on Youth Smoking Behaviors.....	7
Parental Communications about Smoking.....	8
The Influence of Parents' smoking behaviors on children' smoking..	9
Parents' Attitudes toward Smoking	10
The Theory of Planned Behavior and Smoking.....	11
Hypotheses.....	15
3 METHODOLOGY	17
Study Design.....	17
Selection of Participants	17
Data Collection Procedures	19
Measures	20
Data Screening.....	20

CHAPTER	Page
Dependent Variables, Mediators and Independent Variables.....	20
Participants' Smoking Behaviors.....	20
Parents' Attitudes toward Smoking	21
The Attitudes toward Smoking of Siblings and/or Cousins	21
Parental Communication about Smoking	21
Communication about Smoking among Siblings and/or Cousins .	22
.....	22
Parents' Smoking Behaviors.....	22
Smoking Behaviors of Siblings and/ or Cousins	22
Participants' Attitudes.....	22
Participants' Self-efficacy.....	23
Participants' Social Norms	23
Data Analysis	24
Descriptive Analysis	24
Chi-square Test.....	25
Independent T-test	25
Cronbach's Alpha Reliability Test	25
Pearson Product-moment Coefficient Correlation Test.....	25
4 RESULTS.....	26
Preliminary Analyses	26
Gender and Smoking	26
Family Members' Attitudes toward Smoking	27

CHAPTER	Page
Effect of Parents' Attitudes toward Smoking and HECY's Smoking Behaviors	27
Siblings' and/or Cousins' Attitudes toward Smoking and HECY's Smoking Behaviors	28
Communications about Smoking between Family Members and HECY	.29
Parental Communication about Smoking	29
Communication about Smoking among Siblings and/or Cousins	30
Family Members' Smoking Behaviors	30
Parents' Smoking Behaviors.....	30
Smokers' Social Norm from Parents' Smoking Behaviors	31
Non-smokers' Social Norm from Parents.....	31
Siblings' and/or Cousins' Smoking Behaviors.....	32
Smokers' Social Norm from Siblings and/or Cousins.....	32
Non-smokers' Social Norm from Siblings	33
Effect of Participants' Attitudes toward Smoking.....	33
Participants' Self-efficacy of Smoking.....	35
5 DISCUSSION.....	36
Interpretation of Findings	36
The Contribution of Participant Characteristics.	38
Gender Difference in Smoking.....	38
Reasons for Smoking or Not.....	39

CHAPTER	Page
Proximal Cognitive Factors in the Revised TPB Model.	40
HECY’s Attitudes toward Smoking and Their Smoking Behaviors	41
HECY’s Self-efficacy of Smoking	41
HECY’s Perceived Social Norms of Smoking and the Smoking Behaviors of Their Parents, Siblings and/or Cousins	41
Distal Factors of the Revised TPB Model	42
The Influences of Parents	42
Influences of Siblings and/or Cousins	44
Implications	46
Implications for Anti-smoking Campaigns in China.....	46
Implications for Models of Parents and Siblings Influences	47
Future Direction.....	49
Limitation.....	50
Conclusion	51
REFERENCES.....	53
 APPENDIX	
A CONSENT FORM	60
B BACKTRANSLATION FORM.....	64
C QUESTIONNAIRE.....	66
D TABLES	80

LIST OF FIGURES

Figure	Page
1. Study's Model: the Extension Model of the Theory of Planned Behavior .	16
2. Model of Smokers' Family influence & Their Smoking Behaviors	37
3. Model of Non-smokers' Family Influence & Their Smoking Behaviors .	38

CHAPTER 1

INTRODUCTION

China is the world's largest tobacco grower, cigarette producer, and consumer, with 35% of the global tobacco market-share and 30% of the world's smokers (Bureau, 2010). A population survey conducted in 30 provinces of China among urban and rural residents aged 15–69 years old shows that 63% of Chinese males and 3.8% of Chinese females were smokers at the time of the study, accounting for one third of the smokers worldwide (Yang et al., 1999).

Moreover, the smoking population has increased from 320 million smokers in 1996 to 350 million in 2002 (Yang, Ma, Liu, & Zhou, 2005). Zhang and Cai found that there has been a substantial increase in average consumption of cigarettes: ten cigarettes per day in 1990 compared to only one cigarette per day in 1952 (Zhang & Cai, 2003). The high smoking rates have caused about 51.9% of Chinese non-smokers to be exposed to secondhand smoke at least one day per week and about 15 minutes per day in public places, workplaces, and other settings (Yang et al., 2005).

However, there has been a lack of anti-smoking issues in China: the vast majority of anti-smoking campaign studies are conducted in Western countries. The research on Chinese smoking issues predicts that if current trends in smoking continue, the number of tobacco-related deaths will increase from 2 to 3 million per year by 2025 (Jha, 2009). Thus, it is necessary and important to develop more anti-smoking studies in China.

First, what draws researchers' attention is that smoking in China has largely been a male activity (Bresnahan & Zhuang, 2012). Figures show that smoking prevalence

among Chinese males is the highest in the world. Approximately 67% of men smoke compared to 4% of women (Chan, Sarna & Danao, 2008). Therefore, it is necessary to examine gender differences among Chinese smokers.

Another tendency in China is that people tend to start smoking cigarettes when they are quite young. Most previous research on anti-smoking campaigns in China narrows the focus on Chinese high school or middle school students, but ignores college students and graduate students groups. However, compared with high school or middle school students, college students and graduate students are more likely to start smoking and/or maintain a previously established smoking habit. Studies have indicated that levels of cigarette smoking are relatively low among students in middle and high schools. “Among high school students, only about 3–10% boys and less than 0.5% girls are habitual smokers” (Hu et al., 1990; Li et al., 1996). “Approximately 15–25% of middle school boys and 0–5% of middle school girls have tried cigarette smoking” (Li et al., 1996; Chen et al., 1997; Hesketh et al., 2001; Chen et al., 2001).

In contrast, levels of cigarette smoking are substantially higher among the adult population in China. For example, data from the 1996 National Prevalence Survey of Smoking Patterns in China revealed that 66.9% male adults and 4.2% female adults were tobacco users (Yang et al., 1999). Xiang et al. examined 1161 students in medical colleges in Wuhan, China. According to their study, the current smoking prevalence rate was 23% among freshmen; the rate increased to 41% among sophomores (Xiang et al., 1999). Therefore, the current document chooses highly-educated Chinese youths (HECY) as samples to evaluate the risk of cigarette use among Chinese youths.

CHAPTER 2

LITERATURE REVIEW

Research on Reasons for Youths' Smoking

A number of studies investigate the reasons or motives of people's own and others' cigarette smoking. Previous studies found that addiction and relaxation were the most common reasons for adult smoking. For instance, a British researcher has asked British adult and adolescent smokers to complete a checklist about their main occasions for smoking. According to the results of that study, seven reasons for smoking yielded from exploratory factor analysis (EFA): "nervous irritation smoking," "relaxation smoking," "smoking alone," "activity accompaniment," "food substitution," "social smoking," and "social confidence smoking" (McKennell, 1970).

Moreover, in another study conducted by Kleinke and two other researchers, nine motives of smoking were generated by EFA (Kleinke, Staneski, & Meeker, 1983). Kleinke et. al. compared smokers and nonsmokers' responses to a revised version of Coan's (1973) smoking survey in two studies. Study 1 involved 100 females and 100 males in Massachusetts (aged 18 to 42 years): half of the women and men were smokers and the rest were non-smokers. In Study 2, subjects (aged 18 to 51 years) were 102 males and 132 females (52 male smokers and 62 female smokers). "The power of the Revised Smoking Survey in discriminating between smokers and nonsmokers was cross validated by comparing discriminant analysis data from subjects in study 1 and study 2" (Kleinke, Staneski, & Meeker, 1983). As a result, this study identified nine smoking motives: "addiction, affective smoking, forgetful smoking, health-nuisance, relaxation, stimulation,

sophistication, sensorimotor pleasure, and unpleasant habit” (Kleinke, Staneski, & Meeker, 1983).

Studies of Chinese youths’ smoking. The previous research on Chinese young adults smoking generally selected college students as samples and was categorized by geographic differences. For instance, Chen et al. developed a study of cigarette smoking among students from nineteen colleges and universities in Jiangsu province. This study pointed out that “entrance into college may be associated with elevated risk of progression in cigarette use among Chinese students” (Chen et al., 2004). The data, which was derived from 2001’s Chinese Youth Health Risk Behavior Survey, contained 1845 students (44% females) in nineteen colleges and universities in Jiangsu province. “Overall eleven mutually exclusive types (latent classes) of cigarette users were derived and their proportions estimated from four variables: lifetime smoking, past 30-day smoking, attempting to quit in the past, and intention to smoke in the future.” The cross-sectional age and grade trend suggested that “substantial progression in cigarette smoking among Chinese college students, underscoring the need for prevention among these students” (Chen et al., 2004).

Research on Reasons for Adolescents’ Smoking

Compared to the findings of adult smoking, there are both similarities and differences of reasons for adolescent smoking across studies. For example, a longitudinal study of reasons for smoking in adolescence was conducted in New Zealand (McGee & Stanton, 1993). This study examined that “the factors related to smoking at age 13 and to persistence of smoking from ages 13 to 15 years in a sample (n=719) of New Zealand

adolescents” (McGee, Stanton, 1993). Results of this study showed that “reasons for smoking at age 13 were not associated with later smoking; family disadvantage and use of alcohol and other drugs were associated with later adolescent smoking” (McGee, Stanton, 1993).

Stanton et al. also developed a study to compare reasons for participants smoking and not smoking. Three factors were generalized from 18 reasons for smokers to smoke: relaxation/pleasure, friends, and image, and four factors were identified from 17 reasons for nonsmokers’ reasons for not smoking, which were social context, effects of smoking, access, and health reasons (Stanton, Mahalski, McGee, & Silva, 1993).

Thus, we tell that curiosity, image, and social situations were mentioned as reasons for smoking by a number of studies. The current research assumes that family, as a primary social environment for individuals, plays an important role in influencing people’ smoking behaviors.

Studies on Chinese adolescents smoking issues. Compared with their peers in other countries, Chinese adolescents are particularly vulnerable to taking up smoking. Although smoking reduction efforts are underway in China, smoking continues to be prevalent (Chinese Ministry of Health, 2006). In a study of 14,434 Chinese adolescents, “exploratory factor analysis grouped 17 cognitive attributions into 8 factors: curiosity, coping, social image, social belonging, engagement, autonomy, mental enhancement, and weight control. The factors were ranked based on the participants' self-reports of importance and by the strength of their associations with smoking behavior” (Guo, Unger, Azen, Li, Spruijt-Metz, Palmer, Chou, Lee, Sun & Johnson, 2010). Guo et. al. pointed out

that among all smokers, curiosity was the most frequently-ranked factor at the early stages of smoking but not for daily smoking (2010).

Social image and social belonging were more highly-ranked at earlier stages, whereas engagement and mental enhancement were ranked more highly at later stages of smoking. More attributions were associated with smoking among males than among females. This information could be useful for the development of evidence-based anti-smoking programs in China (Guo et.al., 2010).

Many unique factors also contribute to Chinese adolescent smoking, such as the Chinese culture of sharing cigarettes, the low price of cigarettes, the pocket money custom in China, and the smoking prevalence in both private spaces (home) and public places. There is comparatively less enforcement of smoking prevention measures such as smoke free zones in public places.

In Chinese culture, especially for Chinese males, sharing cigarettes with friends continues to be a positive social experience (Chen et al., 2006; Grenard et al., 2006; Ma et al., 2008). Chen et al. described social factors that are related to Chinese adolescent smoking behaviors (Chen et al., 2007).

Moreover, according to previous studies, the low price of cigarettes is one element which encourages Chinese youths to maintain their smoking habit. Even though the price of cigarettes is increasing in China, the price is still cheaper when compared with other western countries. Thus, cigarettes are more accessible for people in China. A recent study also showed that the price of cigarettes is an important determinant of smoking, and higher prices have been shown to reduce smoking participation in low- and middle-income countries (Kostova, Ross, Blecher & Markowitz, 2011).

In addition, as family income increases in China, pocket money is likely to play an increasing role in influencing cigarette smoking in young people. A positive connection has been reported between a higher amount of pocket money and smoking initiation in children in different populations over the last decade. The prevalence of cigarette smoking in Chinese students was higher among those who received a higher amount of pocket money. This relationship existed in both males and females, regardless of school type and household income. “Easy availability and softer regulation of the sale of cigarettes adds to the vulnerability of Chinese adolescents for smoking” (Chen et al., 2006).

Bresnahan and Zhuang developed and tested the impact of a culturally appropriate value-matched smoking prevention message based on family obligation and a value-mismatched message. The research showed that “adolescent girls were affected by the family obligation message showing more disapproval of smoking, more smoking resistance efficacy, less enjoyment of smoking, and fewer misconceptions about the health risks of smoking. On the contrary, males were in an environment that validates and encourages them to smoke”. (Bresna & Zhuang, 2012).

Family Influences on Youths’ Smoking Behaviors

Family, which is the primary socializing environment, can exert an influence on youths’ smoking behaviors. Previous studies, which were mostly conducted in adolescents, examined parents’ influence on their offspring’s smoking behaviors. Generally, parents’ influences have been examined through the communication about

smoking with their offspring, parents' smoking behaviors, and parents' attitudes towards smoking.

Parental communication about smoking. Most research on parental communication about smoking focus on adolescents. Recent studies on the role of parents in the development of adolescents' smoking have concentrated on parents' anti-smoking socialization practices (e.g., Chassin et al. 2005; Harakeh et al. 2005; Jackson & Henriksen 1997). Through the communication about smoking, such as giving rewards or discussing reasons for not smoking and explaining the house rules (Clark et al. 1999), parents try to prevent their children from smoking. Those attempts were shown to be related to a lower risk of adolescents' smoking (Chassin et al. 1998). However, the empirical evidence related to the impact of smoking rules in the home is mixed. According to Henriksen and Jackson (1998) and Wakefield et al. (2000), more restrictive home smoking rules and households that do not permit smoking in the home decreased the risk of youths cigarette use. Apart from this, whether conversations are effective or not depends on the quality of parent-child communication. Harakeh et al. have showed that parents who discuss smoking-related issues in a constructive and respectful manner with their children can prevent adolescents from smoking (Harakeh et al. 2005).

In contrast, some studies showed that the frequency of parental communication about smoking-specific topics was not related to adolescent smoking (Den Exter Blokland et al. 2006; Ennett et al. 2001). Therefore, when exploring the effort of parental communication about smoking-specific topics, it is advantageous to examine the quality of parental communication about smoking.

The influence of parents' smoking behaviors on children' smoking. Parents also influence their children through their own smoking behaviors. It has been shown that adolescents have a higher risk of beginning or continuing smoking when one or both parents are smokers (Mayhew et al. 2000). This can be explained by genetic factors (Brody et al. 2006) and by children modeling parental behaviors (Bandura, 1977).

A more recent study in Hong Kong compared children with smoking parents and those with non-smoking parents, in terms of knowledge and attitudes towards smoking and the influence of parents on smoking irritation (Loke & Wong, 2010). A cross-section study was conducted with students aged 13-15 years, using a questionnaire about smoking habits of their parents and peers, knowledge and attitudes towards smoking, initiation and inclination towards smoking (Loke & Wong, 2010). Chi-square and binary logistic regression were used to analyze the data. The results showed that children with non-smoking parents were more likely than those with smoking parents to have negative attitudes toward smoking.

Moreover, when considering parents as smoking models, it is important to consider both parents' current smoking status, and their smoking history—whether or not they were smokers in the past (Bailey, Ennett & Ringwalt, 1993; Linzer, 1988). According to the research of Linzer (1988), compared with adolescents whose parents were never smokers, the smoking behaviors of adolescents whose parents had quit smoking were more similar to adolescents whose parents currently smoked. Thus, this current study considered parents' lifetime smoking behaviors as opposed to merely their current smoking behaviors.

Parents' attitudes toward smoking. Furthermore, in understanding adolescents' smoking intentions or habits, as Eiser et al. (1991) proposed, it is important to consider not only parents' smoking or non-smoking status, but also their attitudes (as perceived by the adolescent) towards their children's smoking. Many parents disapprove of their children's smoking, even when they smoke themselves. As a result, parent attitudes towards smoking have been offered as a more essential factor than parental smoking behavior in predicting adolescent intentions to smoke. The results of Eiser et al.'s (1991) study showed that regardless of sex or age, parental opposition to adolescents' smoking behaviors had a stronger direct positive effect on adolescents' smoking intentions than did parents' smoking status. Thus, these results reinforce that parents' disapproval of their children's smoking is a significant influence.

Newman & Ward (1989) investigated the influence of parental attitudes on adolescents' smoking behaviors. They utilized a sample of 735 thirteen and fourteen year-old students. According to Newman and Ward's findings, "when neither parent smoked and both parents were indifferent towards their adolescents' smoking behaviors, 17.8% of their children smoked", as opposed to 32.5% of adolescents smoking among parents who were both smokers and both indifferent to their adolescents' decision to smoke (Newman & Ward, 1989). The results suggested that expressing parental objection towards adolescents' smoking behavior seems to affect the likelihood of their smoking, even when opposition was expressed among parents who smoke.

However, few studies have examined influences from other younger family members, such as brothers and sisters. Previous studies examined peer influence on adolescents' smoking, but limited the peer group to best friends and classmates. During

the process, the researchers ignored the effects of the friendship-selection processes and other peers in the adolescents' life, such as siblings. Recent findings suggest that the magnitude of peer influences on risk behaviors might be overestimated, because in many studies the effects of friendship-selection processes were not taken into account (Jaccard et al. 2005). However, compared with other selected peer groups— best friends and classmates— siblings are less likely to be eliminated from the selection process and therefore more likely to influence the youths' smoking behaviors. Furthermore, considering China had carried out one-child policy for about 30 years, most Chinese youths do not have siblings but have cousins. Thus, the current study involved examining cousins' influences as well. Based on this argument, the current research discussed sibling and/or cousins' influences on youths' smoking behaviors.

Therefore, this current research examined the parents, siblings and/or cousins' influences on HECY's smoking behaviors and focused on: (1) parental communication about smoking, (2) the communication about smoking among siblings and/or cousins, (3) the attitudes toward smoking of parents, siblings and/or cousins, and (4) the smoking behaviors of parents, siblings and/or cousins. The research has utilized HECY's self-reported questionnaires to determine whether family influences attribute to HECY's smoking. When analyzing the data from the self-reported questionnaires, quantitative method has been utilized.

The Theory of Planned Behavior and Smoking

The theory of planned behavior (TPB) (Ajzen, 1988, 1991) has emerged as one of the most influential and popular conceptual frameworks for the study of human action

(Ajzen, 2001). According to the theory, human behavior is guided by three kinds of considerations: beliefs about the likely consequences or other attributes of the behavior (behavioral beliefs), beliefs about the normative expectations of other people (normative beliefs), and beliefs about the presence of factors that may further or hinder performance of the behavior (control beliefs). In their respective aggregates, “behavioral beliefs produce a favorable or unfavorable attitude toward the behavior; normative beliefs result in perceived social pressure or subjective norm; and control beliefs give rise to perceived behavioral control, the perceived ease or difficulty of performing the behavior” (Ajzen, 2002). Thus, Ajzen points out, in combination, attitude toward the behavior, subjective norms, and perception of behavioral control lead to the formation of a behavioral intention. The intention is considered to be the immediate antecedent of behavior.

In terms of smoking, the theory of planned behavior postulates that smoking-related cognitions (i.e., attitude, self-efficacy, and social norms) predict intention to start smoking, and intention in its turn predicts actual smoking onset. For instance, Godin, Valois, Lepage and Desharnais have verified the basic assumptions underlying the TPB for the prediction of cigarette smoking intentions and behavior among adults of the general population (study 1) and a group of pregnant women (study 2). In both studies, baseline data was collected at home with questionnaires. A self-report on behavior was obtained 6 months (study 1) and between 8 and 9 months (study 2) after baseline data collection. The results showed: in study 1, for smokers, perceived behavioral control, attitudes and subjective norms explained intention, whereas perceived behavioral control and habit were the most important predictors of behavior. In study 2, smokers’ intentions were mainly under the influence of perceived behavioral control and attitude, whereas

behavior was predicted by perceived behavioral control only (Godin, Valois, Lepage & Desharnais, 1992).

A longitudinal study of Monique et al, with two waves over an 18 months interval, has tested the theory of planned behavior among 346 asthmatic adolescents and 3,733 non-asthmatic adolescents aged 12-16 years. In this study, structural equation models were used to test the predictive value of the TPB in these two groups. The results showed, consistent with the TPB, that smoking-related cognitions (attitude, perceived behavioral control, and subjective norms) predict smoking onset via intention among both asthmatic and non-asthmatic adolescents. The TPB predicted smoking onset even more accurately among adolescents with asthma (Monique et al. 2007).

In addition, self-efficacy also directly predicts actual smoking onset. Various studies have found support for the predictive validity of the TPB with respect to smoking. For instance, De Vries et al. developed a study and showed that intention to smoke was the most powerful predictor in explaining adolescents' future smoking behavior (de Vries, Backbier, Kok & Dijkstra, 1995). Their findings also demonstrated that the impact of smoking-related cognitions (attitude, self-efficacy, and social influences) was largely exerted through intention. These cognitions also made small unique contributions to the prediction of adolescents' smoking behavior. A positive attitude toward smoking or adolescents' perception of the social influence to smoke predicted an increased risk of adolescent smoking. Among the smoking-related cognitions, self-efficacy was the best predictor of adolescents' smoking behavior, with high self-efficacy being negatively related to adolescents' smoking behavior (de Vries, Backbier, Kok & Dijkstra, 1995).

However, the theory of planned behavior only focuses on the role of proximal cognitive factors. Petraitis et al. (Petraitis, Flay, & Miller, 1995) argued that it is important to include distal factors in addition to the proximal factors in the theory of planned behavior to adequately predict experimental substance use, such as tobacco, alcohol, and marijuana use. They suggested that distal factors affect experimental substance use through proximal, cognitive factors. Because several studies showed the relevance of parental factors, Flay et al. (Flay & Petraitis, 1994) proposed to add them to a potential set of distal factors. The theory of planned behavior, however, does not take into account the influence of close family members (parents and/or siblings) when predicting youths' smoking behaviors.

Only a few studies have focused on family influences: a study of Flay et al. (Flay, Hu, Siddiqui, Day, Hedeker & Petraitis, 1994) investigated the mediating effects on adolescents' smoking behavior by extending the TPB via including parental factors as distal factors. Another study was conducted by Harakeh and her cooperators. This research investigated whether general parenting factors (such as quality parent-child relationship, psychological control, strict control, and parental knowledge) and parental smoking added to the TPB in predicting the onset of smoking. A mediation model was applied in which parental factors affected smoking behavior indirectly by affecting smoking cognitions (i.e., attitude, self-efficacy, and social norms). The findings showed that the quality of the parent-child relationship and parental knowledge affected adolescents' smoking behaviors indirectly, while parental smoking behaviors had a direct effect. Strict control and psychological control were found to be unrelated to adolescents' smoking onset (Flay et al., 1994).

However, these studies narrowed the focus on adolescents but did not examine the contribution of the communication about smoking among family members to the youths' smoking behaviors. They did not discuss the influence of family members' attitudes toward smoking either. Moreover, the previous researchers ignored siblings' and/or cousins' roles in affecting the youths' smoking intentions and behaviors. Therefore, the current study filled this gap and extended the model of the TPB by adding family influence factors.

Hypotheses

Based on the literature review and the author's knowledge of Chinese culture, this study proposed H1: Highly-educated Chinese males are more likely to be smokers than highly-educated Chinese females.

In the present study, family influences were checked through examining the smoking-related communication between HECY and their family members, and smoking attitudes and behaviors of participants' parents and siblings and/or cousins. Intending to study family influences on the smoking behaviors of HECY, and in order to examine the extension model of TPB, the following research hypothesis were involved:

H2: Parents' attitudes towards smoking relate to the smoking behaviors of HECY.

H3: There is a relationship between siblings and/or cousins' attitudes about smoking and the smoking behaviors of HECY.

H4: There is a relationship between HECY's smoking behaviors and parental smoking communications.

H5: Smoking communication among siblings and/or cousins is negatively correlated with HECY's smoking behaviors.

H6: Parents' smoking behaviors relate to HECY's smoking behaviors.

H7: Parents' smoking behaviors affect HECY's social norms of smoking.

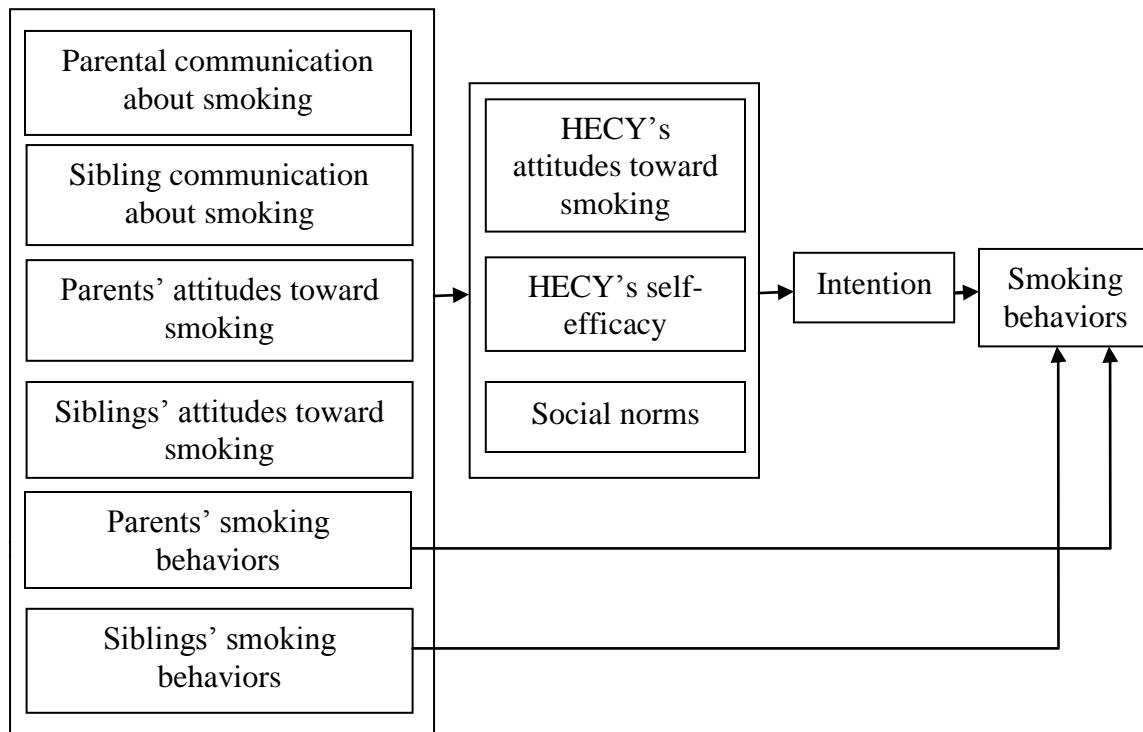
H8: Siblings' smoking behaviors relate to HECY's smoking behaviors.

H9: Smoking behaviors of siblings and/ or cousins influence participants' perceived social norms of smoking.

H10: Smokers are likely to have more positive attitudes toward smoking than non-smokers.

H11: There is a relationship between HECY's smoking behaviors and their self-efficacy of smoking.

Figure1: Study's Model: the Extension Model of the Theory of Planned Behavior



CHAPTER 3

METHODOLOGY

This chapter presents the methods of this study. Specifically, this chapter discusses a description of the study design, method for selection of participants, data collection procedures, measures of variables, and data analysis.

Study Design

The study aimed to examine whether or how family members influence smoking behaviors of HECY who are college students and recent graduates from college with Bachelor's or Master's degrees. This questionnaire-based quantitative study was developed by using self-reported online survey responses from participants. Cross-sectional surveys were utilized to collect the data from the participants. The types of data collected include participants' smoking history and current smoking status; participants' attitudes toward smoking; smoking-related communication between HECY and their family members; and smoking attitudes and behaviors of HECY's parents, siblings and/or cousins.

Anti-smoking studies generally categorize participants into four groups which include 1) never smoked; 2) tried/experimental smokers; 3) regular smokers; and 4) established smokers (Mayhew, Flay, & Mott, 2000). The study has modified this method of participant categorization based on the fact that the participants are young adults whose average age is below 25 years old. Regular smokers and established smokers are rare among the sample population. Thus, participants were grouped into four categories:

1) never smoked; 2) tried smokers/ experimental smokers; 3) current smokers; and 4) current non-smokers. The research analyzed current smokers and current non-smokers' responses to investigate how interactions with family members affect youths' smoking behaviors.

Selection of Participants

The participants of this study are highly-educated Chinese youths who are college students over eighteen years old (freshmen, sophomores, juniors, seniors and graduate students) and recent graduates with Bachelor's or Master's degrees in multiple colleges or universities in mainland China. The participants were selected using two standard methods: 1) convenience samples, utilizing the researcher's personal social network to recruit participants in those Chinese universities; and 2) snow-ball method, also known as networking method described by Burgess (1984), in which the initial participants introduce people with similar education background to participate in the survey.

A total of 195 individuals out 253 recruited participants completed the online survey. In other words, fifty eight responses were excluded from the sample due to incomplete survey from these individuals. Among those 195 participants who, at the time of the study, were studying or have gained their Bachelor's or Master's degrees in colleges/ universities, one hundred and nine (56%) were males; eighty four (43%) were females; and two individuals (1%) did not respond to gender specification. Forty three (22%) of those 195 participants were graduate students, twenty nine (15%) were freshmen, thirty seven (19%) were sophomores, twenty four (12%) were juniors, and eighteen (9%) were seniors. One hundred and seventy seven (93%) of participants were

Han ethnicity and seven percent were other ethnicities (minority ethnicities), the remaining 4 (2%) responses were missing. Participants' ages ranged from 18 to 33 years old ($M = 22.05$).

Data Collection Procedures

The study's data was collected through online questionnaires on the Qualtrics platform, a research software providing online survey service. IRB approval for the study (Number: STUDY00000487) was obtained from Arizona State University in January 2014. After obtaining IRB approval, from January to late February 2014, the researcher distributed consent form and anonymous online survey link through WeChat and QQ (the two most popular Chinese instant messaging software services), RenRen (Chinese online social network) and Facebook.

The consent form and online survey were made available in both English and Chinese because the target participants were Mandarin-speaking Chinese youths. The Chinese translation of the survey questionnaires and consent form were created by the researcher and a certified translator from outside of the project. All translation documents were examined by IRB Administrator. After reviewing the consent form, participants decided whether or not to enroll in the online survey. All participants were voluntary and could stop or withdraw from the study at any time. The responses were anonymous. After collecting initial data from the Qualtrics platform, the data were transferred into SPSS software for further statistical analysis.

Measures

The participants were asked to report their smoking history; current smoking status; their attitudes towards smoking; the smoking communication between them and their family members (parents, siblings and/or cousins); their parents', siblings', and/or cousins' attitudes toward smoking; and their parents', siblings' and/or cousins' smoking behaviors.

Data screening. The original responses to questionnaires were re-coded with SPSS. Lower numbers represented 1) more positive attitudes toward smoking, less communication on smoking, 2) more frequent smoking behavior and 3) having more intention to smoke. Higher numbers indicated 1) more negative attitudes on smoking, 2) more communications on smoking, 3) no or less frequency of smoking behaviors, and 4) no or less intention to smoke.

Dependent variables, mediators and independent variables. The dependent variable in this study was the smoking behaviors of HECY. The mediators of the study model were "HECY's attitudes toward smoking," "self-efficacy," and "social norms." The independent variables include 1) parents attitudes about smoking, 2) the attitudes toward smoking of siblings and/or cousins (if any), 3) parental communication about smoking, 4) the communication about smoking between the participants and their siblings and/or cousins (if any), 5) parents' smoking behaviors, 6) the smoking behaviors of siblings and/or cousins (if any).

Participants' smoking behaviors. The dependent variable was the smoking behaviors of HECY. The participants' smoking behaviors were identified from their responses to the question "do you currently smoke?" The optional responses to the

question are 1 = “Yes” or 2 = “No.” The selection of 1 indicated the respondents were current smokers at the time of the study, and the selection of 2 indicated the respondents were current non-smokers.

Parents’ attitudes toward smoking. The participants were asked to report their parents’ attitudes toward smoking. After the researcher re-coded the responses in SPSS, scales of five measures were used to evaluate parents’ attitudes toward smoking, ranging from 1 “strongly like” to 5 “strongly dislike.”

The attitudes toward smoking of siblings and/ or cousins. The participants also provided their siblings’ and/or cousins’ attitudes toward smoking. After re-coding the responses in SPSS, the scales used to measure siblings and/or cousins’ attitudes toward smoking ranged from 1 “strongly like” to 5 “strongly dislike.”

Parental communication about smoking. Communication between the participants and their parents about smoking were identified from the responses to the following criteria:

- 1) “My mother has made it clear that if she caught me smoking cigarettes there would be definite consequences (punishment).”
- 2) “My father has made it clear that if he caught me smoking cigarettes there would be definite consequences (punishment).”
- 3) “My mother has told me that I should not smoke cigarettes because of the health risks involved.”
- 4) “My father has told me that I should not smoke cigarettes because of the health risks involved.”
- 5) “My parents expressed worry or concern about how smoking might affect me.”

After re-coding the responses in SPSS, the responses to each criterion ranged from 1 “strongly disagree” to 5 “strongly agree.” Cronbach’s alpha of those items is .825, legitimating the items to be treated as a new variable “parental communications” in SPSS.

The communication about smoking among siblings and/or cousins. The impact of communication about smoking among siblings and/or cousins was determined from the responses to the question: “how impactful was your communication with your siblings and/or cousins about smoking? The scales to determine impact of communication ranged from 1 “very low impact” to 5 “very high impact,” and 6 represents “N/A” (not available).

Parents’ smoking behaviors. The participants were asked to report the smoking behaviors of their parents. There were five scales to evaluate the smoking behaviors of the parents: 1 = “smokes daily (smokes at least once a day),” 2 = “smokes once a week or more,” 3 = “smokes once a month or less,” 4 = “has smoked but quit,” and 5 = “has never smoked.”

Smoking behaviors of siblings and/or cousins. The participants provided information about the smoking behaviors of their siblings and/or cousins. After re-coding, there were five scales to evaluate the smoking behavior of siblings and/or cousins: 1 = “smokes daily (smokes at least once a day),” 2 = “smokes once a week or more,” 3 = “smokes once a month or less,” 4 = “has smoked but quit,” and 5 = “has never smoked.”

Participants’ attitudes. Attitude toward smoking refers to the degree of favorable evaluation or appraisal of smoking (Dijkstra, Sweeney, & Gebhardt, 2001). The participants’ attitudes toward smoking were assessed with three items on a seven-point-

scale: “in your mind, smoking is: healthy [1]/ unhealthy [7], good [1]/ bad [7], exciting [1]/ boring [7].”

Participants’ self-efficacy. Self-efficacy refers to the confidence to refuse a cigarette when offered (De Vries, Dijkstra, & Kuhlman, 1988). In this study, participants’ self-efficacy was measured by the following item: “in your mind, refusing a cigarette when one is offered by others is--.” The options available were 1 = “very difficult,” 2 = “difficult,” 3 = “neither difficult nor easy,” 4 = “easy,” and 5 = “very easy.”

Participants’ social norms. The perceived social norms with respect to smoking were assessed by participants’ perception of the approval of families to smoke. The social norms perceived by participants were divided into four parts: 1) the smokers’ social norm of smoking from parents; 2) the non-smokers social norm of smoking from parents; 3) the smokers’ social norm of smoking from siblings and/or cousins; and 4) non-smokers social norm of smoking from siblings and/or cousins.

The smokers’ perceived social norm of smoking from parents was examined by the item “if you smoke, do you think your parents would approve when you smoke?” With SPSS “recode into different variables,” the responses to the question were treated as a new variable “smoker social norm 1.” If the answer to this question is 1 “definitely yes,” then the new value is 1; if the answer to this question is 2 “yes,” then the new value is 2; if the answer is 3 “not sure,” then the new value is 3; if the answer to the question is 4 “no,” the new value is 4; if the answer is 5 “definitely no,” then the new value is 5.

For the non-smokers’ perceived social norm from parents, the participants were asked to answer the question “if you do not currently smoke, do you think your parents would approve if you started to smoke?” The answer to this question is 1 “definitely yes,”

then the new value is 1; if the answer to this question is 2 “yes,” then the new value is 2, if the answer is 3 “not sure,” then the new value is 3, if the answer to the question is 4 “no,” the new value is 4, if the answer is 5 “definitely no,” then the new value is 5.

The study explored smokers’ perceived social norm from their siblings and/or cousins through the responses to the question “if you smoke, do you think your siblings and/or cousins (if any) would approve when you smoke?” After re-coding, the answer to this question is 1 “definitely yes,” then the new value is 1; if the answer to this question is 2 “yes,” then the new value is 2; if the answer is 3 “not sure,” then the new value is 3; if the answer to the question is 4 “no,” the new value is 4; if the answer is 5 “definitely no,” then the new value is 5. New value 6 = “N/A”.

For non-smokers’ perceived social norm from their siblings and/or cousins, the responses to “if you do not currently smoke, do you think your siblings or cousins (if any) would approve if you started to smoke?” were tested. After re-coding, if the answer to this question is 1 “definitely yes,” then the new value is 1; if the answer to this question is 2 “yes,” then the new value is 2; if the answer is 3 “not sure,” then the new value is 3; if the answer to the question is 4 “no,” the new value is 4; if the answer is 5 “definitely no,” then the new value is 5. A new value of 6 represents “N/A”.

Data Analysis

This section includes a discussion of the procedures used for data analysis.

Descriptive analysis. This study analyzed responses’ descriptive statistics: participants’ gender, age, ethnicity, smoking status and history, and education level involving freshman, sophomore, junior, senior, graduate and “not available” option. The

author compared the modes, means, and standard deviations of current smoker and current non-smoker groups.

Chi-square test. A series of Chi-square tests were developed to examine the relationship between nominal or ordinal variables. For instance, the author developed Chi-square test to determine the relationship between gender and smoking behaviors.

Independent T-test. This project utilized an Independent T-test to explore whether there were differences between the current smoker group and the current non-smoker group. For example, in order to examine that parents' attitudes toward smoking do affect participants' smoking behaviors, an Independent T-test was developed.

Cronbach's Alpha reliability test. Three items were used to identify participants' attitudes toward smoking: smoking is healthy [1]/ unhealthy [7], good [1]/ bad [7], exciting [1]/ boring [7]. The Cronbach's Alpha of these items is .686.

Pearson Product-moment Coefficient Correlation test. This study utilized the Pearson Product-moment Correlation test to describe the direction and strength of the linear relationships between the variables, such as the linear relationship between the communication about smoking among siblings and/or cousins and participants' smoking behaviors.

CHAPTER 4

RESULTS

This part focuses on the study's results of quantitative analyses which involve preliminary analysis, Chi-square test, Independent T-test, Cronbach's Alpha reliability test, and Pearson Product-moment Coefficient Correlation test.

Preliminary Analyses

Participants' answers to the question "do you currently smoke?" were used to define participants' smoking status: forty three (22%) of those participants were current smokers, one hundred and fifty two (78%) were current non-smokers. The answer to the question "have you ever smoked cigarettes?" showed the smoking history of participants: at the time of the study, one hundred and eight (55%) participants have never smoked, eighty seven (45%) were tried smokers who have smoked in the past. Moreover, among the eighty seven participants, thirty four of them smoked regularly in the past.

Gender and Smoking

Based on the literature review and the author's knowledge of Chinese culture, it was expected that smoking would be more common amongst men. The study hypothesized that there would be a relationship between gender and smoking behaviors in China.

H1: Highly-educated Chinese males are more likely to be smokers than highly-educated Chinese females.

The answers to the questions “what is your gender?” and “do you currently smoke?” were used to compare participants’ gender and smoking behaviors. Specifically, two responses (1%) to gender question were missing, one hundred and ninety three responses to gender question were examined.

The researcher utilized the Chi-square test to determine whether there is a relationship between gender and smoking behaviors. The result showed that the percentage of participants who smoke did differ by gender, $\chi^2 (1, N = 193) = 10.66, p = .001$ (table 1).

It is worth mentioning that family members’ smoking behaviors also show strong gender differences. One hundred and sixty (86%) participants reported that their mothers have never smoked and only six responses (3%) showed that their mothers smoke daily. Similarly, one hundred and fifty seven responses (90%) presented that the participants’ sisters have never smoked. One hundred and forty seven (83%) responses showed that participants’ female cousins have never smoked. The modes of above three items are all 5.00 (never smoked). However, the mode of the father section is 1.00 (smokes daily): forty five responders chose that their fathers smoke daily; only forty eight (26%) have never smoked; forty had smoked but quit (table 2).

Family Members’ Attitudes toward Smoking

Effect of parents’ attitudes toward smoking and HECY’s smoking behaviors.

H2: Parents’ attitudes towards smoking relate to the smoking behaviors of HECY.

The researcher applied an Independent T-test to examine the relationship between participants smoking behaviors and their parents’ attitudes towards smoking. According

to the results, there was a significant difference in the scores for smoking attitudes from smokers' mothers ($M = 4.08, SD = 1.05$) and smoking attitudes from non-smokers' mothers ($M = 4.53, SD = .85$), $t(167) = -2.63, p = .009$ (table 3). However, fathers' attitudes towards smoking did not present a significant relationship with participants' smoking behaviors ($p = .195$). These results suggested that mothers' attitudes toward smoking have an effect on HECY's smoking behaviors. Specifically, when the mothers have more negative attitudes toward smoking, participants are less likely to be smokers.

Siblings' and/or cousins' attitudes toward smoking and HECY's smoking behaviors. H3: There is a relationship between siblings and/or cousins' attitudes toward smoking and the smoking behaviors of HECY.

The responders reported their siblings' and/or cousins' smoking attitudes through answering the question "please considering one of your sisters (if any), one of your brothers (if any), one female cousins (if any), and one male cousin (if any), please report their attitudes toward smoking". There were five scales of smoking attitudes: from 1 "strongly like" to 5 "strongly dislike."

According to independent T-test results, there was a significant difference of the scores of smokers' brothers' attitudes ($M = 4.06, SD = 1.34$) and non-smokers' brothers' attitudes ($M = 3.73, SD = 1.30$), $t(155) = -2.59, p = .011$ (table 4). The attitudes of other siblings or cousins did not show significant relationships with participants' smoking behaviors. Therefore, the result supported that brothers' smoking attitudes influence HECY's smoking behaviors.

Communication about Smoking between Family Members and HECY

Parental communication about smoking. According to the literature review and the author's observation, the author hypothesized that parental communication about smoking relates to participants' smoking behaviors. H4: There is a relationship between HECY's smoking behaviors and parental communication about smoking.

In order to test the fourth hypothesis, the study computed new variable "parental communication" with five items (see measures). According to the reliability test of those five items, the Cronbach's Alpha is .825 indicating that the author could see those items as one variable. Moreover, the study developed an Independent T-test to explore the relationship between parental communication about smoking and HECY's smoking behaviors. Based on the result, there was no statistical difference of parental communications about smoking between smokers and non-smokers: $t(181) = -.211, p = .834$. Thus, the author failed to claim that parental communication about smoking has a significant relationship with HECY's smoking.

Nevertheless, it is worth mentioning one item of the five criteria "my parents have expressed worry or concern about how smoking might affect me" which was coded as "parents' concern," has showed the linear relationship with HECY's smoking behaviors. According to the Pearson Product-moment Correlation test result, parents' concern was significantly correlated with participants' smoking behaviors ($r = -.13, p = .039$). Thus, parents' concern about the health risks of smoking is negatively correlated to HECY's smoking behaviors. When parents express more concern about the health risks brought by smoking to their adult children, the adult children are less likely to be smokers.

Communication about smoking among siblings and/or cousins. H5:

Communication about smoking among siblings and/or cousins was negatively correlated with HECY's smoking behaviors.

With the purpose to examine communication about smoking among siblings and/or cousins, the study developed the Pearson Product-moment Correlation test. Based on the test results, communication about smoking among siblings and/or cousins was not significantly correlated with participants' smoking behaviors ($r = -.08, p = .15$). Thus, the researcher failed to reject the null hypothesis.

Family Members' Smoking Behaviors

Parents' smoking behaviors. H6: Parents' smoking behaviors relate to HECY's smoking behaviors.

Those participants were asked to report their parents' smoking behaviors. There were five scales to evaluate the smoking behaviors of parents, siblings and/or cousins: from 1 "smokes daily" to 5 "has never smoked."

With the purpose of exploring the relationship between parents' smoking behaviors and participants' smoking behaviors, the study developed an Independent T-test. According to the test results, there was a significant difference in the scores for smokers' fathers' smoking behaviors ($M = 2.28, SD = 1.64$) and non-smokers' fathers' smoking behaviors ($M = 2.92, SD = 1.78$), $t(182) = -2.04, p = .04$ (table 5). In other words, when the father has more smoking behaviors, the participant is more likely to be a smoker.

However, unlike the fathers' section, mothers' smoking behaviors did not show significant relationship with participants' smoking behaviors: $t(183) = -1.02, p = .31$. Therefore, the researcher concluded that fathers' smoking behaviors relate to HECY's smoking behaviors.

H7: Parents' smoking behaviors affect HECY's social norms of smoking.

The researcher examined smokers' and non-smokers' social norms separately.

Smokers' social norm from parents' smoking behaviors. First, the researcher recoded the answers to "if you smoke, do you think your parents would approve when you smoke?" As a result, the value range of responses turned to 1 "definitely yes" to 5 "definitely not" (table 7). Furthermore, the researcher has developed a Chi-square test on the parents' smoking behaviors and smokers' social norm of smoking from parents.

According to Chi-square test results, the percentage of the smokers' social norm toward smoking did not differ by their fathers' smoking behaviors, $\chi^2(12, n = 39) = 15.44, p = .218$. Similarly, the percentage of the smokers' social norm toward smoking did not differ by their mothers' smoking behaviors, $\chi^2(9, n = 40) = 12, p = .213$. Thus, the researcher failed to reject the null hypothesis: smokers' social norm of smoking is not influenced by their parents' smoking behaviors.

Non-smokers' social norm from parents. Based on the responses to the question "if you do not currently smoke, do you think your parent would approve if you started to smoke?" non-smokers' social norm of smoking from parents was defined. According to the Chi-square test result, the percentage of non-smokers' social norms toward smoking did not differ by their mothers' smoking behaviors, $\chi^2(16, n = 145) = 9.49, p = .892$. The percentage of non-smokers' social norm of smoking did not differ by their fathers'

smoking behaviors as well, $\chi^2(16, n = 145) = 12.52, p = .708$. Thus, the author concluded that the smoking behaviors of non-smokers' parents could not influence non-smokers' perceived social norm of smoking.

Siblings' and/or cousins' smoking behaviors. H8: Siblings' and/or cousins' smoking behaviors relate to HECY's smoking behaviors.

Furthermore, the author did Independent T-test again to test the relationship between siblings' and/or cousins' smoking behaviors and participants' smoking behaviors. According to the results, only the scores of brothers' smoking behaviors showed significant difference between the current smoker group ($M = 2.76, SD = 1.85$) and the current non-smoker group ($M = 3.74, SD = 1.73$), $t(165) = -3.03, p = .003$ (table 6). Therefore, the researcher concluded that brothers' smoking behaviors relate to HECY's smoking behaviors.

H9: Smoking behaviors of siblings and/or cousins influence participants' perceived social norms of smoking.

Smokers' social norm from siblings and/or cousins. Smokers' social norm of smoking influenced by siblings and/or cousins was explored by the responses to the question "if you smoke, do you think your siblings or cousins (if any) would approve when you smoke? Similarly, the researcher developed the Chi-square test. According to the results, the percentage of smokers' social norm of smoking did not differ by their siblings' and/or cousins' smoking behaviors: for the brother section, $\chi^2(16, n = 38) = 25.73, p = .058$; for the male cousin section, $\chi^2(16, n = 38) = 15.11, p = .516$; in the sister section, $\chi^2(12, n = 37) = 11.67, p = .473$; in the female cousin section, $\chi^2(16, n = 38) =$

20.60, $p = .194$. Therefore, the conclusion was that the smoking behaviors of siblings and/or cousins did not affect smokers' social norm of smoking.

Non-smokers' social norm from siblings. Non-smokers' perceived social norm from siblings and/or cousins was defined through analyzing responses to "if you do not currently smoke, do you think your siblings and/or cousins (if any) would approve if you started to smoke?" According to Chi-square test, the percentage of smokers' social norms of smoking did not differ by their brothers' and male cousins' smoking behaviors: for the brother section, $\chi^2(20, n = 129) = .411, p = .058$; for the male cousin section, $\chi^2(20, n = 138) = 18.89, p = .530$. However, the percentage of smokers' social norms of smoking did differ by their sisters' and female cousins' smoking behaviors: in the sister section, $\chi^2(15, n = 136) = 25.65, p = .042$ (table 8); in the female cousin section, $\chi^2(20, n = 138) = 35.41, p = .018$ (table 9).

Therefore, the researcher concluded that non-smokers' social norm is influenced by their sisters' smoking behaviors and their female cousins' smoking behaviors: when non-smokers consider trying cigarettes, they will perceive the message that their sisters and female cousins will not approve them to do this. On the contrary, brothers and male cousins did not influence non-smokers' perceived social norm of smoking though.

Effect of Participants' Attitudes toward Smoking

The researcher hypothesized that there are differences between current smokers' and non-smokers' attitudes on smoking. H10: Smokers are likely to have more positive attitudes toward smoking than non-smokers.

The study has compared current smokers and current non-smokers' attitudes toward smoking through those following items: "in your mind, smoking is healthy [1]/unhealthy [7], good [1]/bad [7], boring [1]/exciting [7]." Thus, the higher scores mean more negative attitudes toward smoking. Based on the result of the reliability test of those items, Cronbach's Alpha equals to .686 and Cronbach's Alpha based on standard items is .716. As this is a "marginal" alpha, it makes sense to examine the results for the whole scale and the individual items. These items were computed as a new variable: "responders' attitudes."

In the following process, the researcher developed an Independent T-test to compare current smokers and non-smokers' attitudes towards smoking. According to the result, there was a significant difference in the scores for current smokers' smoking attitudes ($M = 15.41$, $SD = 4.02$) and current non-smokers' smoking attitudes ($M = 18.84$, $SD = 3.31$), $t(189) = -5.60$, $p = .000$ (table 10).

Moreover, in order to present the detailed differences of smokers and non-smokers' attitudes toward smoking, the author developed a series of Independent T-tests for each attitude item. For the question "in your mind, smoking is healthy [1]/unhealthy [7]," there was no significant difference in the scores for the attitude of current smokers ($M = 6.37$, $SD = 1.51$) and non-smokers ($M = 6.67$, $SD = 1.03$), $t(189) = -1.52$, $p = .130$. Thus, the result indicated that smokers and non-smokers all admit that smoking is unhealthy.

However, unlike the responses to smoking is healthy [1]/ unhealthy [7], the analyses of responses to "in your mind, smoking is good [1]/ bad [7]" indicated that non-smokers have more negative attitudes (bad) on smoking. As a result of independent T-test,

there was a significant difference in the scores for current smokers' good or bad attitude toward smoking ($M = 5.57$, $SD = 1.88$) and current non-smokers' good or bad attitude toward smoking ($M = 6.34$, $SD = 1.36$), $t(192) = -2.95$, $p = .004$. Thus, smokers are less likely to see smoking as bad.

When analyzing the responses of "in your mind, smoking is exciting [1]/ boring [7]," the mean of smokers' answers is 3.56, and the mean of non-smokers' responses is 5.82. There was a big difference between smokers' and non-smokers' attitudes toward the excitement level of smoking. Moreover, the result of independent T-test indicated that smokers are more likely to agree that smoking is exciting than non-smokers: $t(193) = -7.28$, $p < .001$ with smokers having smaller scores than non-smokers.

Participants' Self-efficacy of Smoking

H11: There is a relationship between HECY's smoking behaviors and their self-efficacy of smoking.

According to the independent T-Test, there was a significant difference in the scores for current smokers' self-efficacy toward smoking ($M = 2.95$, $SD = 1.09$) and current non-smokers' self-efficacy ($M = 4.09$, $SD = 1.01$), $t(193) = -6.38$, $p = .000$ (table 11). Thus, there is a relationship between participants' smoking behaviors and their self-efficacy: non-smokers are more confident to refuse cigarettes; however, smokers report more difficulty in refusing cigarettes.

CHAPTER 5

DISCUSSION

This study was designed to examine whether family influences affect HECY's smoking behaviors and in which way the family members contribute to the smoking behaviors of HECY. A summary of the study with an interpretation of findings is presented in this chapter. The implications of the current study's findings for future research, a discussion of the limitations associated with the study and the conclusion are also included.

Interpretation of Findings

The previous studies have identified that parents do affect the smoking behaviors of adolescents (Loke & Wong, 2010; Chassin et al. 2005; Harakeh et al. 2005; Mayhew et al. 2000; Chassin et al. 1998; Jackson & Henriksen 1997; Bandura, 1977); however, it remains a question whether family members (parents, siblings and/or cousins) influence youths' smoking behaviors. In addition, based on the literature review, family factors should work as distal factors in the model of TPB (Flay et al, 1994). This present study has evaluated the effectiveness of the revised TPB model by examining the relationships between family members' influence and the smoking behaviors of HECY.

The results of the current study are depicted in two models, as shown in figures 2 and 3. The models show relationships between the study variables for smokers and non-smokers. This section discusses (1) the characteristics of the participants, including their gender and reasons of smoking or not; (2) proximal factors of the revised TPB model

including attitudes, and self-efficacy and social norms; (3) distal factors of the revised model— contributions of Chinese parents (their attitudes, smoking behaviors, and communication practices) and the influences of siblings and cousins.

Figure 2: Model of Smokers' Family Influence & Their Smoking Behaviors

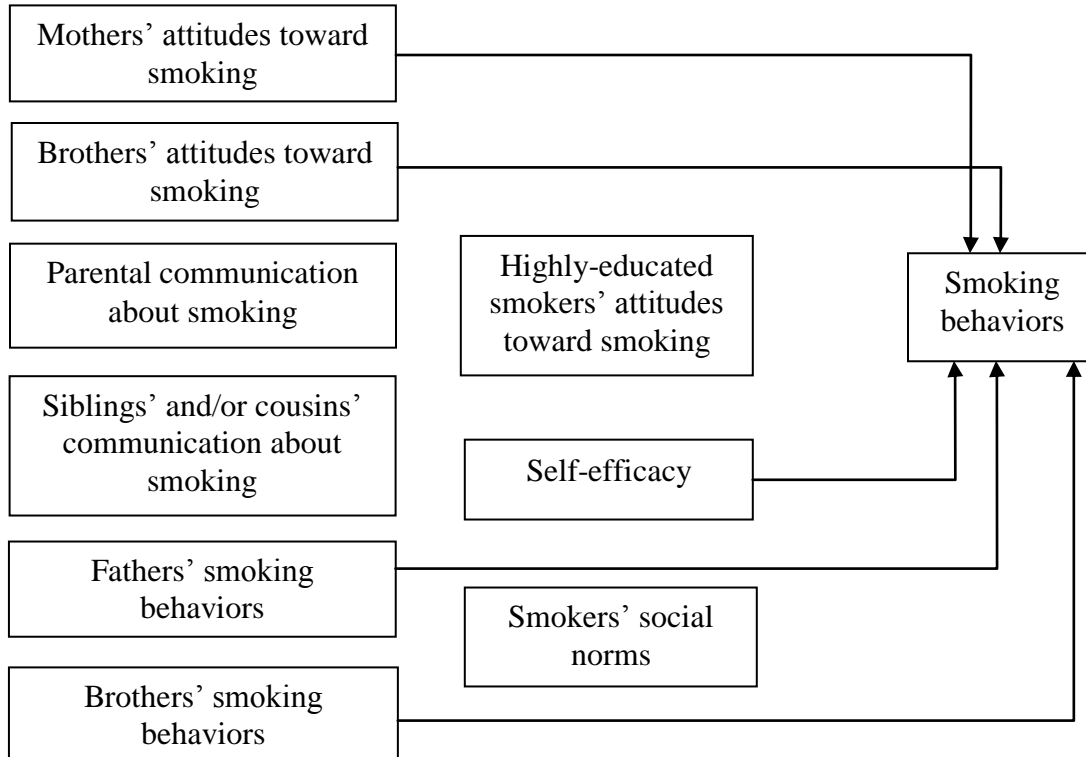
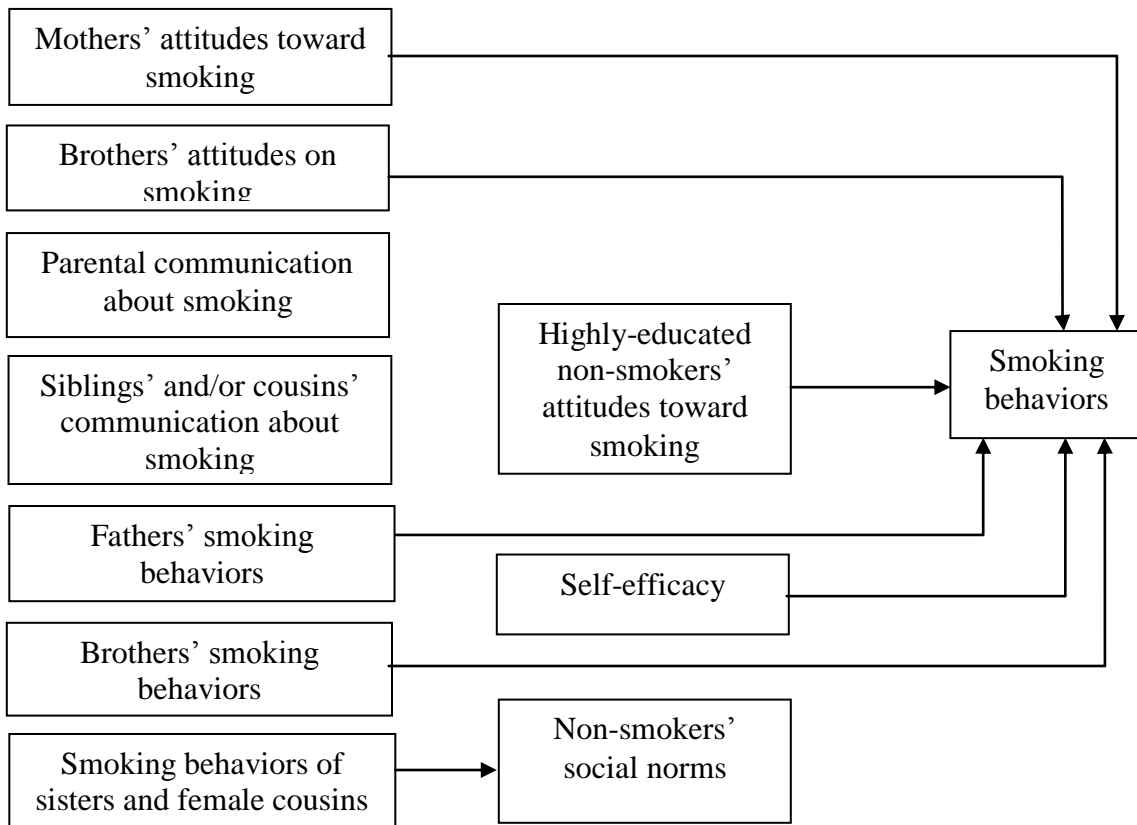


Figure 3: Model of Non-smokers' Family Influence & Their Smoking Behaviors



The contribution of participant characteristics. Previous work has examined the smokers and non-smokers' gender; their reasons for smoking or not; their attitudes toward smoking; their self-efficacy; and social norms (Bresna & Zhuang, 2012; Guo et al., 2010; Chen et al., 2007; de Vires et al., 1995; Stanton et al., 1993; Godin et al., 1992; Kleinke et al., 1983; McKennell, 1970). These last three factors are considered proximal factors in the model of TPB (Petraitis et al., 1995).

Gender difference in smoking. According to the author's knowledge of Chinese culture and previous studies, smoking in China has been largely a male activity (Bresnahan & Zhuang, 2012). The present study's data reveals that nearly 45% of participants have a history of smoking and 22% of participants are current smokers. More

specifically, about 30.3% of males and 10.7% of females are current smokers. Therefore, smoking remains prevalent among highly-educated Chinese males. This is also consistent with the overall smoking tendency in China as proposed by other research (Yang et al., 1999; Chen et al., 2006; Grenard et al., 2006; Ma et al., 2008; Guo et al., 2010). Aside from this, based on the participants' responses, social smoking was reported as the third reason for smoking. Moreover, according to the participants' reports of their parents' smoking status and history, smoking is more prevalent among participants' fathers as well. As a result, participants are likely to perceive the positive message about smoking which is from their fathers' smoking behaviors. Thus, Chinese smokers, who are largely male smokers, live in an environment which encourages them to smoke.

Furthermore, according to the recent data in Chinese anti-smoking research (Li, Hsia & Yang, 2011), an estimated 28.1% of Chinese adults (52.9% of men and 2.4% of women) were smokers. Thus both the overall smoking rate and male smoking rate appear to be declining in HECY population. However, the current study presents a higher smoking rate of highly-educated Chinese females. Therefore, compared with other low-educated women in China, highly-educated Chinese women are more likely to be smokers.

Reasons for smoking or not. This present study also has created two open-ended questions in which the participants use their own words to describe the reasons for smoking or not.

According to the responses from participants who are current smokers and/or people who had a history of smoking, seeking excitement or relaxation is the most common reason for smoking (34%). The finding is consistent with previous research on

adolescents and adults' smoking reasons or motivates (Stanton, Mahalski, McGee, & Silva, 1993; McKennell, 1970). Following relaxation, curiosity (23%) is listed as the second reason for smoking, which is similar to the findings of adolescents' smoking research (Guo et al., 2010). Moreover, social smoking and the influence from peers are reported as the third and fourth reason for smoking. The findings fit well with previous research as well (Stanton et al., 1993; McKennell, 1970).

The responses from non-smokers show that health-nuisance is listed as the number one reason (60%) for not smoking, which fits well with previous studies (Stanton et al., 1993; Kleinke et al., 1983). Unpleasant flavor is the second reason (20%) for not smoking. It is worth mentioning, five participants report that as females, they never try smoking as they do not want to be judged by others. Three responses show that the reason for not smoking is due to the family members' discouragement of smoking. Therefore, the concern of health risks brought by smoking is the most common reason for not smoking. Furthermore, female smoking is still seen as an unaccepted activity in China, which is consistent with H1.

Proximal cognitive factors in the revised TPB model. Previous studies on the TPB model have examined the role of proximal cognitive factors (attitudes, self-efficacy and social norms) in smoking (Monique et al. 2007; Godin et al. 1992). This present study has identified the relationship between HECY's attitudes toward smoking and their smoking behaviors, the connection between HECY's self-efficacy and their smoking behaviors, and the relationship between HECY's social norms of smoking and their family members' smoking behaviors.

HECY's attitudes toward smoking and their smoking behaviors. This present study has supported that HECY's attitudes toward smoking contribute to their smoking behaviors. Specifically, if the youth has more positive attitudes (seeing smoking as good or exciting) toward smoking, he/she is more likely to be a smoker. This finding is consistent with the expectation (hypothesis 10) and fits well with previous studies (Monique et al., 2007; Godin et al., 1992). However, the evidence is mixed. Both smokers and non-smokers all agree that smoking is not healthy. But they do show strong differences when they rate the good or bad level and the excitement level toward smoking. Thus the knowledge that smoking is unhealthy is pervasive among HECY population. With the purpose of preventing people from smoking cigarettes, it is important to correct smokers' beliefs that smoking is good and exciting.

HECY's self-efficacy of smoking. Smokers and non-smokers present significant differences in their self-efficacy of smoking: it is more difficult for current smokers to refuse a cigarette. In contrast, non-smokers report more confidence to refuse smoking. These results are consistent with the eleventh hypothesis of present study. It appears that once HECY have tried smoking, they will have more difficulty refusing cigarettes. These findings are similar to other research on the TPB model of smoking in which self-efficacy is the best predictor of adolescents' smoking behavior (De Vires, Backbier, Kok & Dijkstra, 1995).

HECY's perceived social norms of smoking and the smoking behaviors of their parents, siblings and/or cousins. The original TPB model stresses the potential importance of social norms on smoking decisions. In our Chinese sample, parents were expected to influence their children's social norms of smoking with their smoking

behaviors. However, the examination of parents' smoking behaviors and participants' social norms of smoking revealed no statistically significant relationship. Whether the parents smoke or not, HECY believe they will obtain the approval from their parents to smoke. This finding is not consistent with H7 and does not fit with the previous research on the TPB (Monique et al. 2007).

Similarly, in our sample, the participants' social norms of smoking do not correlate with the smoking behaviors of their brothers and male cousins. However, sisters and female cousins do affect non-smokers' perceived social norm of smoking. If HECY's sisters or female cousins smoke little or not at all, they will perceive that their sisters and female cousins will not approve of their smoking. These findings are consistent with H9.

Distal factors of the revised TPB model. Apart from identifying the proximal factors in the revised TPB model, the present study has further examined the parents' influences, siblings and/or cousins' influences on HECY's smoking behaviors, which work as distal factors in the model of the TPB.

The influences of parents. To some extent, mothers and fathers influence their adult children in different ways. The independent T-test of parents' attitudes and participants' smoking behaviors show that only mothers' attitudes toward smoking have a statistical significant relationship with HECY's smoking behaviors: if the mother has more negative attitudes toward smoking, the adult child is less likely to become a smoker. This finding supports the second hypothesis of the present study. However, unlike the mothers' section, there is no statistically significant relationship between fathers' attitudes towards smoking and HECY's smoking behaviors, which is beyond the author's expectation.

Second, fathers affect their adult children's smoking behaviors directly with their own smoking behaviors: highly-educated smokers' fathers present more smoking behaviors than non-smokers' fathers. The finding supports the sixth hypothesis. Similar finding has been identified in previous research on parents' affects on adolescents' smoking (Bandura, 1977; Linzer, 1988; Bailey, Ennett & Ringwalt, 1993; Mayhew et al. 2000; Loke & Wong, 2010). This finding also indicates if fathers have high smoking frequency (such as smokes daily), their adult children are more likely to be smokers. Nevertheless, there is no significant relationship between HECY's smoking behaviors and their mothers' smoking behaviors, which is not consistent with H6. The gender differences in fathers' and mothers' impacts coincide with the gender differences in smoking.

Thus, it is inferred: 1) Chinese males are more likely to be smokers than Chinese females; 2) mothers tend to have more negative attitudes toward smoking 3) it is the above two factors that make the fathers and mothers influence their adult children's smoking behaviors differently. As Chinese youths living in an environment where their fathers are more likely to smoke, Chinese youths will follow and imitate their fathers' smoking behaviors. Conversely, the mothers are less likely to smoke so that they have more negative attitudes about smoking; as a result, the youths will receive more negative messages about smoking from their mothers.

Aside from this, although it is expected that parents affect their adult children's smoking behaviors simultaneously with parental communication about smoking, the result is not consistent with the author's expectation. This finding does not fit with some previous research on parents' anti-smoking socialization practices (Chassin et al. 2005;

Harakeh et al. 2005; Jackson & Henriksen 1997; Clark et al. 1999; Chassin et al. 1998). Therefore, the influence of parental communication about smoking is not identified and more attention on this section is needed.

Influences of siblings and/or cousins. Previous research on anti-smoking campaigns did not examine the possible influence from siblings and/or cousins. Most studies on peer influences on adolescents and college students' smoking issues have explored the influences from best friends and classmates. However, those studies ignore the influences from siblings and/or cousins who are the closest peers in people's lives. This study has filled this gap by determining the siblings' and/or cousins' contribution to HECY's smoking behaviors.

First, as shown in this study, brothers' attitudes about smoking play an important role in HECY's smoking behaviors: if the brother has more negative attitudes toward smoking, the participant is more likely to be a non-smoker. This finding is consistent with the third hypothesis. Nevertheless, there is no significant difference of other siblings' and cousins' smoking attitudes between smokers and non-smokers.

Furthermore, in the examination of the relationship between the smoking behaviors of siblings and/or cousins and HECY's smoking behaviors, brothers present their significant influences on participants' smoking behaviors again. In other words, when the brother had smoked or currently smokes, the participant has a higher possibility to be a smoker as well. Unlike brothers' important influence, sisters and cousins do not show significant relationship with participants' smoking behaviors. These findings match the hypotheses: "siblings' smoking behaviors relate to HECY's smoking behaviors" (H8).

Third, no significant relationship between participants' smoking behaviors and the communication about smoking among siblings and/or cousins exists. This finding is not consistent with the hypothesis "smoking communication among siblings and/or cousins was negatively correlated with HECY's smoking behaviors" (H5).

Therefore, based on those findings in the siblings and/or cousins section, the following interpretations are generalized:

- 1) Brothers are the most important peers who affect the smoking behaviors of HECY.
- 2) Unlike brothers, male cousins do not present significant influence on the smoking behaviors of HECY. In the current study, there is no statistically significant relationship between male cousins' smoking behaviors and participants' smoking behaviors; no significant relationship exists between male cousins' smoking attitudes and participants' smoking behaviors either.
- 3) A similar gender difference also exists in siblings and/or cousins' influence on the smoking behaviors of HECY: only brothers affect HECY's smoking behaviors in a direct way. Sisters and female cousins merely influence highly-educated non-smokers' social norms of smoking.

In conclusion, based on the current study's findings, it is obvious that the family influences on the smoking behaviors of HECY present strong gender differences. Male family members tend to be the role models of smoking for HECY; on the other hand, female family members influence the smoking behaviors of HECY in an indirect way. As shown in figure 2 and 3, for both highly-educated Chinese smokers and non-smokers, the smoking behaviors of fathers and brothers affect the participants' smoking behavior directly; mothers affect the participants with their attitudes towards smoking. However,

as shown in figure 2, for smokers, sisters and female cousins do not present significant influence on smokers' smoking behaviors. Nevertheless, in Figure 3, for non-smokers, sisters and female cousins do contribute to the non-smokers' social norm of smoking.

Implications

Based on all the findings in this present study, some implications for both practical and theoretical building are presented. Those implications will contribute to Chinese anti-smoking campaigns and other research on the TPB model of smoking.

Implications for anti-smoking campaigns in China. What can we do to reduce smoking in China, which has the largest number of smokers in the world? The gender difference among smokers and non-smokers implies that anti-smoking policies or anti-smoking campaigns should treat male smokers and female smokers differently. First, male smokers who live in a smoking environment are more likely to be vulnerable to smoking. Thus, anti-smoking campaigns should focus on how to reduce public smoking which encourages Chinese youths to smoke. Moreover, as shown in the study's sample, highly-educated Chinese female youths have a larger smoking rate compared with the female adults' smoking rate in China. It might be a result of the fact that highly-educated Chinese women are more independent. Concerned with the responses that females are afraid of negative judgments of their smoking is few, highly-educated Chinese women might be more confident with their smoking behaviors. Therefore, it is necessary to develop the research on highly-educated Chinese women's smoking behaviors.

Second, as shown in the current study's findings, fathers and brothers tend to be the smoking models for the participants. In this study, compared with other message

toward smoking, such as negative attitudes toward smoking and communication about smoking, the effect of family members' smoking behaviors appears to play a more significant role in Chinese youths' smoking, which is not consistent with previous research on parents' attitudes toward smoking and adolescents' smoking behaviors (Eiser et al., 1991). Thus, Chinese anti-smoking campaigns should pay more attention to male family members' influence on Chinese youths' smoking behaviors.

Furthermore, the present study finds that although highly-educated Chinese smokers have the knowledge that smoking is unhealthy, they still smoke. Chinese smokers agree that smoking is exciting which is a different opinion than non-smokers. This phenomenon could provide a point of focus when presenting the correct attitudes toward smoking. Anti-smoking campaigns should emphasize that smoking is not exciting as smokers describe or expect. For instance, anti-smoking advertisements can portray the bad effects of smoking cigarettes for the public, such as the family problems brought by smoking, health consequences of smoking including the negative impacts on non-smokers through second-hand smoke, and other non-smokers' negative attitudes toward smokers.

Implications for models of parents and siblings influences. This study did not find a significant relationship between parental communication and Chinese youths' smoking behaviors. However, this does not mean there is no relationship between those two variables. According to the responses to reasons for smoking or not, three responses show that it is family members' discouragement of smoking that prevents them from smoking. Therefore, to some extent, parental communication about smoking does have influence on Chinese youths' smoking behaviors. Nevertheless, as a result that the current

study's sample is limited, it remains a question as to what power of parental communication's effect on Chinese youths' smoking behaviors could have.

As shown in the literature review section, siblings and cousins' influences on youths' smoking behaviors have been ignored. Conversely, the findings of this present study implicate that siblings and cousins are the important source of influence for youths' smoking. Among the siblings and cousins, the brother is the most significant factor. Both brothers' attitudes and smoking behaviors contribute to Chinese youths' smoking behaviors. Those findings imply that more research should pay attention to siblings and cousins' effects toward smoking.

Furthermore, based on the findings, this current study has identified the revised TPB model. The findings of the current study support that attitudes and self-efficacy do work as proximal factors in the revised TPB model and contribute to the participants' smoking behaviors. However, this study did not identify the relationship between Chinese youths' social norms of smoking and their smoking behaviors. In the revised TPB model of current study, the attitudes toward smoking of parents, siblings and/or cousins, the smoking behaviors of parents, siblings and/or cousins do work as distal factors in the revised TPB model. As for the functions of parental communication and the communication about smoking among siblings and/or cousins in the revised model, more research is needed. The relationships between proximal factors and distal factors in the revised TPB model are not identified, so more examinations are required.

Future Direction

For future research on anti-smoking campaigns, three areas are worth more attention or emphasis. First, future studies should involve more tests on the middle section of the revised TPB model: the relationship between family factors and the proximal factors in the TPB model (youths' attitudes toward smoking, the self-efficacy and social norms of smoking). For instance, whether the parents' attitudes toward smoking, and/or their smoking behaviors, and/or parental communication will contribute to their adult children's smoking attitudes, self-efficacy, and/or social norms of smoking. This present study does not involve the tests on this part as there are some limitations which will be mentioned below. Nevertheless, in future research, multiple regression tests or other tests might help examine these relationships.

Second, this current study does not examine the intention factor and its function in the revised model of TPB. For the theoretical consideration, more tests on the intention part will contribute to further research on the theory of planned behavior. Moreover, the examination of the relationship between intention and smoking behaviors could help build anti-smoking policies which prevent non-smokers from starting smoking and reduce the number of current smokers.

Third, this study has determined that fathers' smoking behaviors and mothers' attitudes toward smoking do affect their adult children's smoking behaviors. However, when there are two contrary messages toward smoking, which message will play a more important role in HECY's smoking? For instance, when parents (or one parent) have/ has negative attitudes toward smoking but smoke/smokes at the same time, which message, the negative attitudes toward smoking or the parents' smoking behavior, will be the

determining factor affecting their adult children's smoking behaviors? Thus, it is necessary and important to find out the impacts of each smoking message from parents and identify each level of family members' various influences on youths' smoking behaviors.

Limitation

First, this present study does not have a large enough sample size: only 43 current smokers and 152 non-smokers are enrolled in this study. Compared with the large number of non-smokers, the small sample size of smokers makes it so this study cannot further determine to what extent the family factors could influence smokers' smoking behaviors, and this study could not make full comparison of non-smokers' and smokers' differences. The ideal sample should consist of half of the participants as smokers, and half as non-smokers; moreover, the rate of gender should be equal as well.

Second, this current study is only based on the analysis of HECY's self-reported responses. Therefore, all responses are the participants' perceived information and might not reflect the reality. This study should have interviewed the family members as well to obtain the first-hand information about family members' attitudes, communication about smoking among family members, and their smoking behaviors.

Third, this study has examined the HECY's smoking behaviors, but does not examine the low-educated Chinese who also occupy a large portion of the population in China. As HECY obtain more knowledge and are more independent, the family influences on the highly-educated population might be limited. However, low-educated people might not be as independent and knowledgeable as highly-educated people, so it is

possible that family factors have more significant effects on them. Therefore, in order to identify the relationship between the smoking behaviors of most Chinese and their family members' influences, more research on smoking among low-educated people smoking should be involved.

Fourth, this present study has involved the examination of family members' influences on Chinese youths' social norms of smoking. However, this study does not consider the larger cultural forces that shape Chinese youths' social norms of smoking, such as media exposure.

Conclusion

Several aspects of this study make it unique amid the existing body of research on anti-smoking campaigns, family communication, and the TPB model. First, this study provides more information for anti-smoking campaigns to reduce smoking in China. Chinese anti-smoking campaigns should treat female smokers and male smokers differently as smoking is still a predominantly male activity in China even among a highly-educated population. This study also has determined the parents' different roles in their adult children's smoking behaviors. Fathers are more likely to be the role model of smoking for their adult children. On the contrary, mothers affect their adult children's smoking by their attitudes toward smoking.

The most important contribution of this study is that it identifies how siblings and/or cousins affect HECY's smoking behaviors. Brothers, who influence their siblings' smoking with their smoking attitudes and behaviors, are the most significant smoking influence source for HECY. This aspect of the present study fills the gap that previous

research ignored the siblings' and/or cousins' possible contribution to young adults' smoking.

Last, this study extends the TPB model: it identifies the relationships of family members' attitudes, smoking behaviors and HECY's smoking behaviors: it also examines the relationship between family members' smoking behaviors and HECY's perceived social norms of smoking. Although it does not examine all the possible relationships between family factors and other proximal factors (attitudes and self-efficacy) in TPB, its findings could provide more information for future research on distal factors in TPB to predict smoking.

REFERENCES

- Ajzen, I. (1988). *Attitudes, personality, and behavior*. Chicago, IL: Dorsey.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179–211.
- Ajzen, I. (2001). Nature and operation of attitudes. *Annual review of psychology*, 52(1), 27–58.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32(4), 665–683.
- Bailey, S. L., Ennett, S. T. & Ringwalt, C. L. (1993). Potential mediators, moderators, or independent effects in the relationship between parents' former and current cigarette use and their children's cigarette use. *Addictive Behaviors*, 18, 601–621.
- Bandura, A. (1977). *Social learning theory*. Oxford: Prentice-Hall.
- Bresnahan, M. J. & Zhuang, J. (2012). A test of two smoking prevention messages for Chinese adolescents. *China Media Research*, 8(3).
- Brody, A. L., Mandelkern, M. A., Olmstead, R. E., Scheibal, D., Hahn, E., Shiraga, S., Zamora-Paja, E., Farahi, J., Saxena, S., London, E. D. & McCracken, J. T. (2006). Gene variants of brain dopamine pathways and smoking-induced dopamine release in the ventral caudate/nucleus accumbens. *Archives of General Psychiatry*, 63, 808–816.
- Bureau, B.B. (2010), *China tobacco industry profile*. Retrieved October 10, 2013, from <http://www.bharatbook.com/detail.asp?id=129819&rt=China-Tobacco-Industry-Profile.html>
- Chan, S.S., Sama, L. & Danao, L. L. (2008). Are nurses prepared to curb the tobacco epidemic in China? A questionnaire survey of schools of nursing. *International Journal of Nursing Studies*, 45(5), 706–713.

Chassin, L., Presson, C. C., Rose, J., Sherman, S. J., Davis, M. J. & Gonzalez, J. L. (2005). Parenting style and smoking-specific parenting practices as predictors of adolescent smoking onset. *Journal of Pediatric Psychology*, *30*, 333–344.

Chassin, L., Presson, C. C., Todd, M., Rose, J. S. & Sherman, S. J. (1998). Maternal socialization of adolescent smoking: The intergenerational transmission of parenting and smoking. *Developmental Psychology*, *34*, 1189–1201.

Chen, W., Wen, X., Muscat, J., Qian, Z., Lu, C., Zhang, C., Luo, Y., Liang, C., Han, K., Deng, X., Ou, Y. & Ling, W. (2007). Modifiable family and school environmental factors associated with smoking status among adolescents in Guangzhou, China. *Preventive Medicine*. *45*, 189–197.

Chen, X., Bian, Y., Xin, T., Wang, L. & Silbereisen, R. K. (2010). Perceived social change and childrearing attitudes in China. *European Psychologist*, *15*, 260–270. doi:10.1027/1016-9040

Chen, X., Li, X., Stanton, B., Mao, R., Sun, Z., Zhang, H., Qu, M., Wang, J. & Thomas, R. (2004). Patterns of cigarette smoking among students from 19 colleges and universities in Jiangsu Province, China: a latent class analysis. *Drug and Alcohol Dependence*, *76*, 153–163.

Chen, X., Li, Y., Unger, J.B., Gong, J., Johnson, C.A. & Guo, Q. (2001). Hazard of smoking initiation by age among adolescents in Wuhan, China. *Preventive Medicine*. *32*, 437–445.

Chen, X., Stanton, B., Fang, X., Li, X., Lin, D., Zhang, J. & Yang, H. (2006). Perceived smoking norms, socioenvironmental factors, personal attitudes and adolescent smoking in China: A mediation analysis with longitudinal data. *Journal of Adolescent Health*, *38*

Chen, Z.M., Xu, Z., Collins, R., Li, W.X. & Peto, R., (1997). Early health effects of the emerging tobacco epidemic in China. A 16-year prospective study. *JAMA* *278*, 1500–1504.

Chinese Ministry of Health. (2006). *Health report warns of unhealthy lifestyle*. Retrieved from: http://english.gov.cn/2006-01/12/content_156860.htm

Clark, P. I., Scarisbrick-Hauser, A., Gautam, S. P. & Wirk, S. J. (1999). Anti-tobacco socialization in homes of African-American and white parents, and smoking and nonsmoking parents. *Journal of Adolescent Health, 24*, 329–339.

Coan, R. W. (1973). Personality variables associated with cigarette smoking. *Journal of Personality and Social Psychology, 26*(1), 86–104.

De Vries, H., Backbier, E., Kok, G. & Dijkstra, M. (1995). The impact of social influences in the context of attitude, self-efficacy, intention, and previous behavior as predictors of smoking onset. *Journal of Applied Social Psychology, 25*, 57–237.

De Vries, H., Dijkstra, M., Kuhlman, P. (1988). Self-efficacy: the third factor besides attitude and subjective norm as a predictor of behavioral intentions. *Health Education Research, 3*, 273–282.

Den Exter, Blokland, E. A. W., Hale, W. W.III., Meeus, W. & Engels, Rutger C. M. E. (2006). Parental anti-smoking socialization: Associations between parental anti-smoking socialization practices and early adolescent smoking initiation. *European Addiction Research, 12*, 25–32.

Dijkstra, A., Sweeney, L. & Gebhardt, W. (2001). Social cognitive determinants of drinking in young adults: beyond the alcohol expectancies paradigm. *Addictive Behaviors, 26*, 689–706.

Eiser, J.R., Morgan, M. & Gammage, P. (1991). Adolescent health behavior and similarity attraction: Friends share smoking habits (really) but much else besides. *British Journal of Psychology, 30*, 48–339.

Ennett, S. T., Bauman, K. E., Foshee, V. A., Pemberton, M. & Hicks, K. A. (2001). Parent-child communication about adolescent tobacco and alcohol use: What do parents say and does it affect youth behavior? *Journal of Marriage and Family, 63*, 48–62.

Farkas, A., Distefan, J., Choi, W., Gilpin, E. & Pierce, J. (1999). Does parental smoking cessation discourage adolescent smoking? *Preventive Medicine*, 28(3), 8–213.

Flay, B. R., & Petraitis, J. (1994). The theory of triadic influence: A new theory of health behavior with implications for preventive interventions. In G. Albrecht (Ed.), *Advances in Medical Sociology, Vol. 4*, 19–44., Greenwich, CT: JAI Press.

Flay, B. R., Hu, F. B., Siddiqui, O., Day, L. E., Hedeker, D., Petraitis, J., Richardson, J. & Sussman, S. (1994). Differential influence of parental smoking and friends' smoking on adolescent initiation and escalation of smoking. *Journal of Health and Social Behavior*, 35, 65–248.

Godin, G., Valois, P., Lepage, L. & Desharnais, R. (1992). Predictors of smoking behaviour: an application of Ajzen's theory of planned behavior. *British Journal of Addiction*, 87, 1335–1343.

Grenard, J. L., Guo, Q., Jasuja, G. K., Unger, J. B., Chou, C. P., Gallaher, P. E. & Johnson, C. A. (2006). Influences affecting adolescent smoking behavior in China. *Nicotine and Tobacco Research*, 8, 245–255. doi: 10.1080/1462220600576610

Guo, Q., Unger, J.B., Azen, S.P., Li, C., Spruijt-Metz, D., Palmer, P.H., Chou, C.P., Lee, L., Sun, P. & Johnson, C.A. (2010). Cognitive attributions for smoking among adolescents in China. *Addictive Behaviors*, 35, 95–101

Harakeh, Z., Scholte, R. H. J., De Vries, H. & Engels, Rutger C. M. E. (2005). Parental rules and communication: Their association with adolescent smoking. *Addiction*, 100, 862–870.

Harakeh, Z., Scholte, R. H. J., Vermulst, A. A., De Vries, H. & Engels, Rutger C.M.E. (2004). Parental factors and adolescents' smoking behavior: an extension of the theory of planned behavior. *Preventive Medicine*, 39, 951–961.

Henriksen, L. & Jackson, C. (1998). Anti-Smoking socialization: relationship to parent and child smoking status. *Health Communication*, 10, 87–101.

Hesketh, T., Ding, Q.J. & Tomkins, A. (2001). Smoking among youths in China. *American Journal of Public Health, 91*, 1653–1655.

Hu, J.F., Liu, R.Z., Zhang, H.L., Xu, X.F., Li, K., Yang, R.Z., Li, S.X. & Zhang, Z.T. (1990). A survey of cigarette smoking among middle school students in 1998. *Public Health, 104*, 345–351.

Jaccard, J., Blanton, H., & Dodge, T. (2005). Peer influences on risk behaviour: An analysis of the effects of a close friend. *Developmental Psychology, 41*, 135–147.

Jackson, C., & Henriksen, L. (1997). Do as I say: Parent smoking, antismoking socialization, and smoking onset among children. *Addictive Behaviors, 22*, 107–114.

Jha, P. (2009). Avoidable global cancer deaths and total deaths from smoking. *Nature Reviews Cancer, 9*, 655–664.

Kleinke, C. L., Staneski, R. A. & Meeker, F. B. (1983). Attributions for smoking behavior: comparing smokers with nonsmokers and predicting smokers' cigarette consumption. *Journal of Research in Personality, 17*, 242–255.

Kostova, D., Ross, H., Blecher, E. & Markowitz, S. (2011). Is youth smoking responsive to cigarette prices? Evidence from low- and middle-income countries. *Tobacco Control, 19*, 463–468.

Li, X., Fang, X. & Stanton, B. (1996). Cigarette smoking among Chinese adolescents and its association with demographic characteristics, social activities, and problem behaviors. *Substance Use and Misuse, 31*, 545–563.

Lizer, M.A. (1988). *Quality of the parent-adolescent bond in the modeling of parent smoking behavior*. Unpublished master's thesis, San Diego State University, San Diego, CA.

Loke, A.Y. & Wong, Y.P.I. (2010). Smoking among young children in Hong Kong: influence of parental smoking. *Journal of Advanced Nursing, 66* (12), 2659–2670. doi: 10.1111/j.1365-2648.2010.05419.x

Ma, S., Hoang, M., Samet, J. M., Wang, J., Mei, C-Z., Xu, X. & Stillman, F. A. (2008). Myths and attitudes that sustain smoking in China. *Journal of Health Communication, 13*, 654–666. doi: 10.1080/10810730802412222

Mayhew, K. P., Flay, B. R. & Mott, J. A. (2000). Stages in the development of adolescent smoking. *Drug and Alcohol Dependence, 59*, S61–S81.

McGee, R. & STANTON, R.W. (1993) A longitudinal study of reasons for smoking in adolescence. *Addiction, 88*, 265–271.

McKennell, A. C. (1970). Smoking motivation factors. *British Journal of Social and Clinical Psychology, 9*(1), 8–22.

Monique, O.M. Van de Ven., Engels, Rutger C. M. E., Roy Otten. & Regina J. J. M. Van Den Eijnden. (2007). A longitudinal test of the theory of planned behavior predicting smoking onset among asthmatic and non-asthmatic adolescents. *Journal of Behavior Medicine, 30*, 45–435.

Newman, I. M. & Ward, J. M. (1989). The influence of parental attitude and behavior on early adolescent cigarette smoking. *Journal of School Health, 59*, 150–152.

Petraitis J, Flay, B.R. & Miller TQ. (1995). Reviewing theories of adolescent substance use: organizing pieces in the puzzle. *Psychological bulletin, 117*(1), 67–86.

Stanton, W. R., Mahalski, P. A., McGee, R. & Silva, P. A. (1993). Reasons for smoking or not smoking in early adolescence. *Addictive Behaviors, 18*(3), 321–329.

Wakefield, M. A., Chaloupka, F. J., Kaufman, N. J., Orleans, C. T., Barker, D. C. & Ruel, E. E. (2000). Effect of Restrictions on Smoking at Home, at School, and in Public places on Teenage Smoking: Cross Sectional Study. *British Medical Journal, 32*(7257), 333–337.

Xiang, H., Wang, Z., Stallones, L., Yu, S., Gimbel, H.W. & Yang, P. (1999). Cigarette smoking among medical college students in Wuhan, People's Republic of China. *Preventive Medicine, 29*, 210–215.

Yang, G., Fan, L., Tan, J., Qi, G., Zhang, Y., Samet, J. M., Taylor, C. E., Becker, K. & Xiu, J. (1999). Smoking in China: findings of the 1996 national prevalence survey. *JAMA*, 282(13), 1247–1253.

Yang, G., Ma, J., Liu, N. & Zhou, L. (2005). Smoking and passive smoking in Chinese. *Chinese Journal of Epidemiology*, 26, 77–83.

Zhang, H. & Cai, B. (2003). The impact of tobacco on lung health in China. *Respirology*, 8(1), 17–21.

APPENDIX A

CONSENT FORM

STUDY TITLE: Family influences on Chinese college students' smoking: extending the framework of the theory of planned behavior

I am a graduate student under the direction of Professor Dr. Vincent Waldron in the New College of Interdisciplinary Arts and Sciences at Arizona State University. I am conducting a research study to examine family influences on Chinese college students' smoking behaviors and intentions.

I am inviting your participation, which will involve (1) your basic information, (2) questions about your smoking status, (3) your attitudes on smoking, (4) information about smoking communication among family members, your parents' smoking status and attitudes, siblings' attitudes and siblings' smoking behavior. As participants in this study, you should be 18 years or older. You will take around 10 to 15 minutes to finish the online questionnaire. You have the right not to answer any question, and to stop participation at any time.

Your participation in this study is voluntary. You can choose not to participate or to withdraw from the study at any time.

Through taking part in the research, participants might receive some indirect benefits: you will take more attention on your families' advice and/or attitudes on smoking, and then make corresponding reflection, such as you might try to give up smoking following families' persuasion. Your responses will be analyzed to examine family influences on college students' smoking intentions and behaviors, and then provide more information for Chinese anti-smoking studies. There are no foreseeable risks or discomforts to your participation.

Your responses will be anonymous. The results of this study may be used in reports, presentations, or publications but your name will not be used. Moreover, the data will be only accessed by the researcher and will be stored in a computer with access password.

If you have any questions concerning the research study, please contact the research team at: xjin25@asu.edu. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788. Filling out the survey will be considered your consent

同意书

研究题目：家庭对中国大学生吸烟的影响：拓展计划行为理论的框架

本人是一名亚利桑那州立大学新跨学科文理学院的研究生。目前，我在教授文森特·沃尔德伦的指导下，研究家庭对中国大学生吸烟行为和吸烟倾向的影响。

在此，我诚挚地邀请您参与问卷调查。问卷包括：（1）个人基本信息，（2）您的吸烟状态信息，（3）您对吸烟的态度，（4）你家庭成员之间关于吸烟话题的交流，您父母的吸烟状况及他们对吸烟的态度，您与兄弟姐妹之间关于吸烟的交流，他们对吸烟的态度以及他们的吸烟状况。作为参与者，您应该年满 18 岁。您将需要大约 10 到 15 分钟时间完成网络问卷。您有权利选择不回答问卷，或者在任何时刻停止继续回答问卷。

您的参与是自愿的非强制性的。如果您选择不参与问卷调查或者想撤销您已有的回答，您可以随时停止。

通过参与到这个研究，参加者能获得间接的益处：您能更多地关注家人对吸烟行为的意见或态度，从而做出回应，例如，根据家人的劝说尝试戒烟。您的回答将被用来分析家庭因素对大学生吸烟倾向和吸烟行为的影响，从而为中国的反烟研究提供更多的信息。而且，您的参与不会为您带来任何可预见的风险或者不利。

您的回复将是匿名的。这项研究的结果会用于报告，讲座，或者出版，但是您的名字不会被使用。而且，只有研究者才能接触到这些数据，数据将被保存到一个有密码保护的电脑中。

如果您对此项研究有任何的疑问，请通过电子邮件联系研究小组：xjin25@asu.edu。

如果您对作为在此项研究中参与者的权利有任何疑问，或者认为您在参与的过程中会承担风险，请通过亚利桑那州立大学科研诚信与保障办公室，来联系伦理审查机构委员会主席，电话（480）965-6788。填写此问卷将被视为您已经同意参与到此次研究的调查。

APPENDIX B

BACKTRANSLATION FORM

Arizona State University
 Office of Research Integrity and
 Assurance
 660 S. Mill Avenue Suite 315
 Arizona State University
 Tempe AZ 85287-6111
 (Mail Code 6111)
 Phone: 480-965-6788
 Fax: (480) 965-7772



For Office Use Only:
 Date Received:

**Translation Certification Form
 Institutional Review Board (IRB)**

PROTOCOL TITLE: Family influences on Chinese college students' smoking: extending the framework of the theory of planned behavior
HS NUMBER: STUDY00000487
PRINCIPAL INVESTIGATOR: Dr. Vincent Waldron
LANGUAGE OF TRANSLATED DOCUMENTS: Chinese

TYPE OF SUBMISSION	
<input checked="" type="checkbox"/>	The initial submission of the following forms: consent form and questionnaire
<input type="checkbox"/>	The modification of the following forms that have been approved. (Please list forms)
<input type="checkbox"/>	Other (Please describe and list forms)

CERTIFICATION OF TRANSLATION

I certify that I have performed the translation of the following documents: consent form and the online questionnaire for the referenced project.

Printed Name of Translator: Xianlin Jin

Signature of Translator: *Xianlin Jin* Date: 01/09/2014

CERTIFICATION OF BACK-TRANSLATION

I certify that I have performed the back-translation of the following documents: consent form and the online questionnaire for the referenced project.

Printed Name of Back-Translator: Xuan Wang

Signature of Back-Translator: *Xuan Wang* Date: 01/09/2014

APPENDIX C

QUESTIONNAIRE

Part 1: Basic information 基本信息

1. What is your gender? 你的性别是?
 - A. Female 女性
 - B. Male 男性
 - C. Other 其他

2. What is your age—? 你的年龄是?

3. What ethnicity do you best identify with? 你的民族是?
 - A. Han 汉族
 - B. Other 其他民族
 - C. Not sure 不确定

4. Which province are you from? 你（的家庭）来自哪个省/直辖市?

5. What year in school are you? 你的年级?
 - A. Freshman 大一
 - B. Sophomore 大二
 - C. Junior 大三
 - D. Senior 大四
 - E. Graduate 研究生
 - F. N/A 不适用于我的情况

6. Where do you live? 你现在居住在哪里
 - A. On-campus 校内

B. Home 家里

C. Off-campus but not at home 校外但是不在家里

7. If you don't live at home, how many times do you visit your home per semester? 如

果你不住在家里，那么你每学期回家的频率是？

1. Never visit my home 我不会回家

2. One time 一次

3. Two or Three times 两到三次

4. Once per month 每月一次

5. Once per week 一周一次

6. More than once per week.多于一周一次

Part 2: Participants smoking status 参与者的吸烟状态

8. Have you ever smoked cigarettes? 你曾经吸过烟吗？

A.No, never smoked 没有，从来没有吸过烟

B. Yes, smoked few times in the past 有，吸过几次

C. Yes, smoked regularly in the past 有，曾经经常吸烟

9. Do you currently smoke? 你现在吸烟吗？

A. Yes 是

B. No 否

10. In your own words, please explain why you smoke or why you do not smoke? 用你

自己的语言，请解释您吸烟的原因或者您不吸烟的原因？

11. How many years have you been smoking regularly? 你的烟龄 (年) 大概是多久?

12. If you smoke, how frequently do you smoke? 如果你吸烟, 你吸烟的频率是?

1. every day 每天
2. every other day 每两天
3. twice a week 一周两次
4. once a week 一周一次
5. every other week 每两周一次
6. once a month or less 一月至多一次

Part 3: Participants' attitude toward smoking 被测者关于吸烟的态度

13. In your mind, smoking is--. 在你看来, 吸烟是

Healthy Unhealthy
健康 不健康

1, 2, 3, 4, 5, 6, 7. Please indicate your score—请写出你的得分

Good Bad
好 坏

1, 2, 3, 4, 5, 6, 7. Please indicate your score—请写出你的得分

Exciting Boring
令人兴奋 无聊

1, 2, 3, 4, 5, 6, 7. Please indicate your score—请写出你的得分

14. If you are a smoker, in your mind, to become a nonsmoker is--. 如果你是位吸烟

者, 在你心中, 成为一位非吸烟者是

1. very difficult 非常困难的
2. difficult 困难的
3. neither difficult nor easy 既不困难也不容易

4. easy 容易的

5. very easy 非常容易的

15. If you are a non-smoker, in your mind, to stay a non-smoker is --.如果你是一位非吸烟者，在你心中，保持住非吸烟者的状态是

1. very difficult 非常困难的

2. difficult 困难的

3. neither difficult nor easy 既不困难也不容易的

4. easy 容易的

5. very easy 非常容易的

16. If you smoke, do you think your parents would approve when you smoke? 如果你吸烟，当你吸烟的时候，你认为你的父母会同意你吸烟（的行为）吗？

1. definitely not 肯定不同意

2. not 不同意

3. not sure 不确定

4. yes 同意

5. definitely yes 肯定同意

17. If you do not currently smoke, do you think your parents would approve if you started to smoke? 如果你现在不吸烟，当你想吸烟的时候，你认为你的父母会同意你吸烟吗？

1. definitely not 肯定不同意

2. not 不同意
3. not sure 不确定
4. yes 是
5. definitely yes 肯定同意

18. If you smoke, do you think your siblings or cousins would approve when you smoke?

如果你吸烟，当你吸烟的时候，你认为你的（堂/表）兄弟姐妹会同意你吸烟吗？

1. definitely not 肯定不同意
2. not 不同意
3. not sure 不确定
4. yes 同意
5. definitely yes 肯定同意
6. N/A 不适用于我的情况

19. If you do not currently smoke, do you think your siblings or cousins would approve

if you started to smoke? 如果你现在不吸烟，当你想吸烟的时候，你认为你的（堂/表）兄弟姐妹会同意你吸烟吗？

1. definitely not 肯定不同意
2. not 不同意
3. not sure 不确定
4. yes 同意
5. definitely yes 肯定同意

6. N/A 不适用于我的情况

20. In your mind, refusing a cigarette when one was offered by others is --. Please indicate your score. 在你看来，拒绝他人给你的香烟是

1. very difficult 非常困难的
2. difficult 困难的
3. neither difficult nor easy 既不困难也不容易
4. easy 容易的
5. very easy 非常容易的

21. If you do not currently smoke, do you think you will ever start smoking? 如果你现在不吸烟，你认为你将来会吸烟吗？

1. absolutely not 完全不会
2. not 不会
3. not sure 不确定
4. yes 会
5. absolutely yes 完全会

22. If you currently smoke, do you think you will to stay a smoker? 如果你现在吸烟，你认为你将来会继续保持吸烟吗？

1. absolutely not 完全不会
2. not 不会
3. not sure 不确定

4. yes 会

5. absolutely yes 完全会

Part 4: Smoking communication among family members, parental smoking attitudes, siblings' attitudes, parental smoking, and siblings' smoking behavior. 家庭成员之间关于吸烟的交流，父母对吸烟的态度，兄弟姐妹对吸烟的态度，

23. Have your parents spoken explicitly with you about the rules of smoking in the house? 你的父母曾经明确地告知你在家里的吸烟规则吗

A. Yes. 是

B. No. 否

24. My mother has made it clear that if she caught me smoking cigarettes there would be definite consequences (punishment). 我的妈妈清楚地告诉我，如果她发现我吸烟，她会给我惩罚。

1. strongly agree 非常同意

2. agree 同意

3. neither agree nor disagree 既不同意也不反对

4. disagree 不同意

5. strongly disagree 非常不同意

25. My father has made it clear that if he caught me smoking cigarettes there would be definite consequences (punishment). 我的爸爸清楚地告诉我，如果他发现我吸烟，他会给我惩罚

1. strongly agree 非常同意

2. agree 同意
3. neither agree nor disagree 既不同意也不反对
4. disagree 不同意
5. strongly disagree 非常不同意

26. My mother has told me that I shouldn't smoke cigarettes because of the health risks involved. 我的妈妈曾经告诉我我不应该吸烟因为吸烟会带来健康隐患

1. strongly agree 非常同意
2. agree 同意
3. neither agree nor disagree 既不同意也不反对
4. disagree 不同意
5. strongly disagree 非常不同意

27. My father has told me that I shouldn't smoke cigarettes because of the health risks involved. 我的爸爸曾经告诉我不应该吸烟因为吸烟会带来健康隐患

1. strongly agree 非常同意
2. agree 同意
3. neither agree nor disagree 既不同意也不反对
4. disagree 不同意
5. strongly disagree 非常不同意

28. My parents expressed worry or concern about how smoking might affect me? Please indicate your scores--. 关于吸烟可能对我产生的影响，我的父母曾表达过担忧。请写出您的得分--。

1. strongly agree 非常同意
2. agree 同意
3. neither agree nor disagree 既不同意也不反对
4. disagree 不同意
5. strongly disagree 非常不同意

29. My mother has told me that whether or not I smoke cigarettes is entirely up to me.

我的妈妈曾经告诉我，我吸烟与否完全取决于我自己

1. strongly agree 非常同意
2. agree 同意
3. neither agree nor disagree 既不同意也不反对
4. disagree 不同意
5. strongly disagree 非常不同意

30. My father has told me that whether or not I smoke cigarettes is entirely up to me. 我

的爸爸曾经告诉我，我吸烟与否完全取决于我自己。

1. strongly agree 非常同意
2. agree 同意
3. neither agree nor disagree 既不同意也不反对
4. disagree 不同意
5. strongly disagree 非常不同意

31. How impactful was your communication with your parents about smoking? 你和父

母之间关于吸烟的交流对你有何种程度的影响?

1. very strong impact 非常强的影响

2. strong impact 强影响

3. medium impact 中度影响

4. low impact 弱影响

5. very low impact 非常弱的影响

32. How impactful was your communication with your siblings or cousins (if any) about

smoking? 你和（堂/表）兄弟姐妹之间关于吸烟的交流对你有何种程度的影响?

1. very strong impact 非常强的影响

2. strong impact 强影响

3. medium impact 中度影响

4. low impact 弱影响

5. very low impact 非常弱的影响

6. N/A 不适用于我的情况

33. I care what my mother thinks of my smoking behavior. 我在意我母亲对我吸烟行

为的看法

1. strongly agree 非常同意

2. agree 同意

3. neither agree nor disagree 既不同意也不反对

4. disagree 不同意

5. strongly disagree 同意

34. I care what my father thinks of my smoking behavior. 我在意我父亲对我吸烟行为的看法

1. strongly agree 非常同意

2. agree 同意

3. neither agree nor disagree 既不同意也不反对

4. disagree 不同意

5. strongly disagree 同意

35. In the past 6 months, how frequently has the smoking communication between you and your parents occurred? 在过去的 6 个月里，你与你父母之间关于吸烟话题的交流发生的频率？

1. never 从来没有

2. very rarely 十分少

3. rarely 少

4. frequently 经常

5. very frequently 十分经常

36. In the past 6 months, how frequently has the smoking communication between you and your siblings occurred? 在过去的 6 个月里，你与兄弟姐妹之间，关于吸烟话题的交流发生的频率？

1. never 从来没有
2. very rarely 十分少
3. rarely 少
4. frequently 经常
5. very frequently 十分经常

37. Considering your parents, one of your brothers, one of your sisters, two of your cousins (female and male), please report their smoking status, their attitudes on smoking and their age. 考虑你的父母，你的一个哥哥（或者弟弟），一个姐姐（或者妹妹），你的表/堂兄（弟），一个堂/表姐（妹），请根据他们的情况，报告他们的吸烟状态，对吸烟的态度和他们年龄。

Smoking status:

1. has never smoked 从未吸烟
2. has smoked but already quit 曾经吸烟但已戒烟
3. smokes once a month or less 每月至多一次
4. smokes once a week or more 每周至少一次
5. smokes daily (at least once a day) 一天至少一次

Attitudes on smoking:

1. strongly dislike 非常不喜欢
2. dislike 不喜欢
3. neutral 中立
4. like 喜欢

5. strongly like 非常喜欢

Family members 家庭成员	Smoking status (1 to 5) 吸烟状态	Attitudes on smoking (1 to 5) 对吸烟的态度
Mother 母亲		
Father 父亲		
Brother 兄 (弟)		
Sister 姐 (妹)		
Cousin (male) 表/堂兄 (弟)		
Cousin (female) 表/堂姐 (妹)		

APPENDIX D

TABLES

Table 1

Chi-square test on Relationship between Gender and Smoking Behaviors

Smoking Behaviors	Gender		χ^2	df	p
	Female	Male			
Yes	9	33	10.66	1	.001
No	75	76			
Total	84	109			

Table 2

Statistics of Family Members' Smoking Behaviors

		MS	FS	SS	BS	FCS	MCS
N	Valid	185	184	174	167	177	176
	Missing	10	11	21	28	18	19
Mode		5.00	1.00	5.00	5.00	5.00	5.00
Range		4.00	4.00	4.00	4.00	4.00	4.00
Mean		4.66	2.79	4.81	3.52	4.56	2.98
Minimum		1.00	1.00	1.00	1.00	1.00	1.00
Maximum		5.00	5.00	5.00	5.00	5.00	5.00

Note. 1 = smokes daily, 5 = has never smoked. MS = Mother Smoking, FS = Father Smoking, SS = Sister Smoking, BS = Brother Smoking, FCS = Female Cousin Smoking, MCS = Male Cousin Smoking.

Table 3

Independent T-test on Parents' Attitudes toward Smoking: Current Smokers v.s. Non-smokers

	Participants Smoking		<i>t</i>	<i>df</i>	<i>p</i>
	Yes	No			
Mothers' Attitudes	4.08 (1.05)	4.53 (.074)	-2.63	167	.009
Fathers' Attitudes	2.89 (1.47)	3.25 (1.48)	-1.31	170	.195

Note. Standard Deviations appear in parentheses below means.

Table 4

Independent T-test on Siblings and/or Cousins' Attitudes toward Smoking: Current Smokers v.s. Current Non-smokers

	Participants Smoking		<i>t</i>	<i>df</i>	<i>p</i>
	Yes	No			
SA	4.40 (.77)	4.44 (.89)	-.20	152	.842
BA	3.06 (1.34)	3.73 (1.30)	-2.59	155	.011
FCA	4.15 (1.06)	4.22 (.98)	-.40	158	.693
MCA	3.03 (1.43)	3.30 (1.29)	-1.03	157	.305

Note. Standard Deviations appear in parentheses below means. SA = Sisters' Attitudes, BA = Brothers' Attitudes, FCA = Female Cousins' Attitudes, MCA = Male Cousins' Attitudes.

Table 5

Independent T-test on Parents' Smoking Behaviors: Current Smokers v.s. Current Non-smokers

	Participants Smoking		<i>t</i>	<i>df</i>	<i>p</i>
	Yes	No			
Mothers' Smoking	4.52 (1.11)	4.70 (.089)	-1.02	183	.310
Fathers' Smoking	2.28 (1.64)	2.92 (1.77)	-2.04	182	.043

Note. Standard Deviations appear in parentheses below means.

Table 6

Independent T-test on Siblings/ Cousins' Smoking Behaviors: Current Smokers v.s.

Current Non-smokers

	Participants Smoking		<i>t</i>	<i>df</i>	<i>p</i>
	Yes	No			
SS	4.70 (.85)	4.84 (.56)	-1.17	172	.243
BS	2.76 (1.85)	3.74 (1.73)	-3.02	165	.003
FCS	4.42 (1.24)	4.60 (1.04)	-.88	175	.380
MCS	2.84 (1.90)	3.02 (1.83)	-.53	174	.595

Note. Standard Deviations appear in parentheses below means. SS = Sisters' Smoking,

BS = Brothers' Smoking, FCS = Female Cousins' Smoking, MCS = Male Cousins'

Smoking.

Table 7

Statistics of Smokers' Social Norm of Smoking from Parents

N	Valid	43
	Missing	152
Mode		4.00
Range		3.00
Mean		3.61
Minimum		2.00
Maximum		5.00
Standard Deviation		1.02

Note. 1 = definitely yes, 2 = yes, 3 = not sure, 4 = not, 5 = definitely not.

Table 8

Chi-square of Non-smokers' Social Norm of Smoking and Their Sisters' Smoking Behaviors

Sister Smoking	Non-smokers' Social Norm of Smoking Affected by Siblings/ Cousins						χ^2	df	p
	DY (n =3)	Y (n = 24)	NS (n = 60)	N (n = 31)	DN (n = 23)	N/A (n = 10)			
SS2	0	1	0	0	0	1			
SS3	1	1	0	3	0	1			
SS4	0	2	2	0	0	0			
SS5	2	18	51	25	20	8			
Total	3	22	53	28	20	10	25.65	15	.042

Note. DY = Definitely Yes, Y = Yes, NS = Not Sure, N = No, DN = Definitely No, N/A = Not Available. SS2 = smokes once a week or more, SS3 = smokes once a month or less, SS4 = has smoked but quit, SS5 = has never smoked.

Table 9

Chi-square of Non-smokers' Social Norm of Smoking and Their Female Cousins'

Smoking Behaviors

Female Cousin Smoking	Non-smokers' Social Norm of Smoking Affected by Siblings/ Cousins						χ^2	df	p
	DY (n = 3)	Y (n = 24)	NS (n = 60)	N (n = 31)	DN (n = 23)	N/A (n = 10)			
FCS1	0	3	3	0	1	0			
FCS2	1	2	0	0	0	1			
FCS3	0	2	1	1	0	1			
FCS4	1	1	2	2	0	0			
FCS5	1	16	45	25	21	8			
Total	3	24	51	28	22	10	35.41	20	.018

Note. DY = Definitely Yes, Y = Yes, NS = Not Sure, N = No, DN = Definitely No, N/A = Not Available. FCS1= smokes daily, FCS2 = smokes once a week or more, FCS3 = smokes once a month or less, FCS4 = has smoked but quit, FCS5 = has never smoked.

Table 10

Independent T-test on Participants' Attitudes toward Smoking: Current Smokers v.s.

Current Non-smokers

	Participants Smoking		<i>t</i>	<i>df</i>	<i>p</i>
	Yes	No			
Participants' Attitudes toward Smoking	15.41 (4.02)	18.84 (3.31)	-5.60	189	.000

Note. Standard Deviations appear in parentheses below means. Bigger scores of attitudes represent more negative attitudes toward smoking.

Table 11

Independent T-test on Participants' Self-efficacy of Smoking: Current Smokers v.s.

Current Non-smokers

	Participants Smoking		<i>t</i>	<i>df</i>	<i>p</i>
	Yes	No			
Participants' Self-efficacy of Smoking	2.95	4.09	-	193	.000
	(1.09)	(1.01)	6.38		

Note. Standard Deviations appear in parentheses below means. Bigger scores of self-efficacy mean that refusing cigarettes is easier for participants.