Smoking Control

Smoking Among Adolescents in China: An Analysis Based Upon the Meanings of Smoking Theory

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Abstract

Purpose. *This study utilized the Meanings of Behavior theory to examine whether meanings of smoking differ among adolescents in China who were never smokers, ever smokers, and past-30-day smokers. The Meanings of Behavior theory argues that affect takes precedence over cognitive constructs in motivating behavior. This study also examined whether the associations among meanings of smoking and smoking behavior vary by age and gender.*

Design. *This study was a cross-sectional study using survey data.*

Setting. *Middle and high schools in seven cities in China.*

Subjects. *A random sample of 4724 students comprised this study.*

Measure. *A self-administered questionnaire asked about smoking behavior and incorporated the meanings of smoking scale.*

Results. *Overall prevalence rates of ever smokers and past-30-day smokers in this sample were 24.3% and 9.0%. Smoking was much more prevalent in boys than in girls. Students in the 11th grade were more likely than those in the 7th grade to have tried smoking at some time and to have smoked within the past 30 days. Odds ratios confirmed that meanings of smoking were significantly associated with smoking behaviors.*

Conclusions. *Meanings of smoking are associated with smoking behavior among Chinese adolescents in that smoking may connote autonomy, control, or social relatedness. Prevention programs in China require new strategies to incorporate meanings of smoking in order to meet adolescent psychological needs for autonomy, competence, and social connections. (Am J Health Promot 2006; 20[3]:171–178.)*

Key Words: Adolescents Smoking, Gender Differences, Meanings of Smoking, Prevention Research, China Seven Cities Study. Manuscript format: research; Research purpose: intervention testing; Study design: quasi-experimental; Outcome measure: cognitive and behavioral; Setting: school; Health focus: smoking control; Strategy: education; Target population: youth; Target population circumstances: education/income level and geographic location

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INTRODUCTION

Despite having knowledge of adverse health consequences, adolescents continue to take up smoking. To understand this behavior, we need to explore the benefits that adolescents attribute to smoking. Researchers adopting the Meanings of Smoking theory have identified several meanings that underlie smoking initiation among adolescents.[1–3] Adolescents who see smoking as a way of exhibiting autonomy, reducing stress, or regulating mood are more likely to smoke, as are those who see smoking as a way of making interpersonal connections with peers.[2] To date, these meanings of smoking have been identified only for adolescents living in Western countries.[4,5] In the present study, we ask whether similar mechanisms drive smoking onset among adolescents in China. We also explore differences in the relationships between meanings of smoking and smoking behavior across age and gender. In China, smoking is socially accepted for adults but not for children. A cultural pattern in China is that smoking is a normative behavior among males but is rare among females.[6]

Meanings of Behavior

In contrast to the focus on knowledge, cognition, and skills that underlies the self-efficacy and social-influences models that currently form most smoking interventions,[7,8] the Meanings of Behavior theory, as proposed by Spruijt-Metz,[1] argues that affect takes precedence over cogni-

tive constructs in motivating behavior. The theory is based on a synthesis of the research on affective determinants of behavior such as reasons for smoking and functional meanings of smoking and takes into account the strong motivational roles that emotions play.[1,9–11] Meanings are conceptualized as being affective, immediate, and often disassociated from available information about consequences. In general, adolescents tend to behave according to their feelings, bypassing analytic thought.[1,12] Adolescents who have positive affect toward smoking are more likely to begin to smoke.[13,14]

The meanings with which adolescents imbue behaviors are purely personal and intrinsic. For example, adolescents may ignore the knowledge that eating sweets is bad for their teeth and fattening. For them, eating sweets might represent ways of comforting themselves; rewarding themselves; or dealing with frustration, anger, or stress. Drinking soda pop instead of milk may be an expression of personal taste and independence. Similarly, skipping lunch may take on meanings of exercising personal will or of challenging authority. These personal meanings of behavior may vary across developmental stages during adolescence and may also differ by gender and culture.[1]

Meanings of Smoking for Adolescents

In a study on the meanings of smoking among Chinese-American college students,[2] three categories of meanings of smoking were identified: personal, functional, and social.[4] Personal meanings, which are primarily intrapersonal, were found to be associated with rebellion, independence, and mood regulation. Functional meanings, which also have an intrapersonal component, were reported to be associated with achieving physical or environmental goals, such as enhancing concentration and reducing fatigue and anxiety. Social meanings are concerned with interpersonal relations, such as acceptance by peers and a sense of belonging. Adolescents perceived smoking as a means of helping with their daily concerns. Meanings of smoking are modifiable correlates of smoking that can be influenced through health promotion efforts. Previous research has shown that meanings of health-related behavior can be changed, and that changes in relevant meanings will in turn change targeted behaviors.[1]

In this study, we examined whether meanings of smoking in Chinese adolescents differ among never smokers, ever smokers, and past-30-day smokers. We hypothesized that students who endorsed personal, functional, and social meanings of smoking would be more likely to smoke. We also expected that the associations between the meanings of smoking and these smoking behaviors varied by age and gender.

METHOD

Design

Data for the current analysis were obtained from a cross-sectional study conducted in seven cities in China between October 2001 and March 2002. The purpose of the China Seven Cities Study is to assess specific influences on tobacco use and related health behaviors as they might arise during the rapid, unprecedented economic growth and subsequent social and cultural changes occurring in China as it moves toward a market economy. The geographically, economically, and culturally diverse cities participating in this research—Harbin and Shenyang (Northeast), Wuhan (Central), Chengdu and Kunming (Southwest), and Hangzhou and Qingdao (Coastal)—represent a broad spectrum of economic developmental stages.

Participants

The study population consisted of 7th-grade middle school students and 11th-grade traditional high school students from each city. To ensure sample uniformity across cities, all schools were chosen from the city district where the local government (Mayor's office) is situated. With the assistance of each city's Education Committee, middle schools and high schools within the local government district were identified as schools of high, middle, and lower academic quality; students are assigned to these schools on the basis of previous academic achievement. For the middle school sample, one school within each of the three designations was randomly selected. For the high school sample, the top and middle designations were combined, so that the sample in each city consisted of one randomly selected top- or middle-range school and one lower-range school. In every school, two classrooms were randomly selected and students were invited to take the survey. Across the seven cities, a total of 2310 7th graders and 2702 11th graders were invited to take part in the study. Of those, 3.6% of the 7th graders and 7.6% of 11th graders either did not provide parental consent or were absent from school on the day of data collection. Of those who were invited to participate, a total of 2227 (96.4%) 7th graders and 2497 (92.4%) 11th graders completed the survey and thereby comprised the sample.

Procedure

All questionnaires were anonymous and participants were asked not to write any information that might identify them on the questionnaires. All students completed the questionnaire during class time, and classroom teachers were not present during the survey period so that students would feel more at ease in responding to the questionnaire items. Seventh and 11th graders took home consent forms and questionnaires for their parents to complete; students returned the consent forms and questionnaires to their classroom teachers in sealed envelopes. Written parental consent was obtained from all parent or guardian respondents. Because individual youth-student assent documentation is not widely used in China and may be disruptive to cultural beliefs, we utilized an oral assent process with a standardized script. The institutional review board established in China and the U.S. Office for Human Research Protection, with whom we consulted, recommended this method.

A trained local person in each city read aloud the script, which ap-

peared on the cover page of the youth version of the questionnaire, verbatim to each class of 7th and 11th graders before questionnaire administration. The script explained the study objectives and procedures. Data collectors were prepared to answer questions that students had about the study or questionnaire. If a student said that he or she did not wish to be in the study, the data collector noted this on the class roster and dismissed the student from the survey administration even if the parent had signed a consent form. Both the University of Southern California and the Chinese Institutional Review Boards approved all study procedures and survey instruments.

Survey Instruments

The paper-and-pencil questionnaire incorporated items from the U.S. Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System, Youth Risk Behavioral System, 1995 Youth Risk Behavioral System, and Transdisciplinary Tobacco Use Research Center–Wuhan Smoking Trial Survey. This instrument included the Meanings-of-Smoking Index. Translators who were fluent in both English and Mandarin and trained in tobacco research translated questionnaire items from English to Mandarin and then back translated them to English. To ensure proper idiomatic language, a group of bilingual tobacco researchers reviewed each item. The questionnaire booklets were printed in identical formats across all seven cities to ensure consistency. The questionnaire contained 52 items and took roughly 30 minutes to complete.

Measures

Ever-tried Smoking Prevalence. Students were asked, "Have you ever tried smoking, even a few puffs?" Those who responded "no" and "yes" were respectively coded as "never smokers" and "ever smokers."

Past-30-day Smoking Prevalence. Students were asked, "Think about the last 30 days. On how many of these days did you smoke cigarettes?" Responses were reported on a seven-point scale ranging from "0 days" to "all 30 days." In this study, the analyses were performed on a dichotomized version of the past-30-day smoking variable. Responses were recoded as 0 days vs. 1 or more days. Students who reported smoking during the past 30 days were coded as "past-30-day smokers."

Meanings of Smoking. The Meanings of Smoking Index, developed by Spruijt-Metz et al.,[4] was used to assess meanings of smoking among adolescents. Two aspects of personal meanings of smoking were measured: smoking as an act of autonomy and smoking as a way of regulating mood. Items included "I smoke because it makes me feel like I am making my own decisions," "I smoke because it helps me forget my problems," and "I smoke because it gives me more energy." One aspect of functional meanings of smoking, weight control, was measured with two items, one of which was "I smoke because it helps me to control my appetite." Social meanings of smoking were measured with three items related to experience of smoking as fostering interpersonal connections. One of these items was "I smoke to make friends." Responses were reported on a four-point scale: 1 = "strongly disagree" to 4 = "strongly agree." Cronbach alpha for the entire scale was .87, and Cronbach alphas for the subscales of personal, functional, and social relevant meanings of smoking were .79, .83, and .81. Because of concerns about the tendency that traditional Chinese culture suppresses extreme responses,[15] each of the eight items was recoded to a dichotomous measure: "strongly agree" or "agree" vs. "strongly disagree" or "disagree."

Rationale for Including City, Media, and Personal Allowance as Covariates. Preliminary analysis revealed significant differences in adolescent smoking prevalence across the seven cities, which may be attributable to different geographic locations, economic disparity, and preference for Western media. Therefore, a city might confound the association between the predictor variables and smoking. Preference for non-Chinese media was used as a covariate because smoking imagery portrayed in more Westernized advertisements might affect the relationship between adolescent smoking and psychological states. Three questions were asked to assess this preference: "Where do most of your favorite TV shows come from?" "Where do most of your favorite movies come from?" and "What is your favorite kind of music?" Response options included China, Hong Kong, Taiwan, Japan, and the United States for the first two questions and several types of Asian and Western music for the third question. Because all these countries other than China have been subject to Western influences for many years, we scored the responses dichotomously. The China option was scored as 0, and any other was scored as 1. Each student's score for degree of preference for non-Chinese media was the sum of the three recoded responses and could therefore range from 0 to 3. Personal allowance was included as a covariate because it was used as an indicator of socioeconomic status. In China, adolescents who are not constrained by money might be more likely to buy cigarettes.[16]

Data Analysis

Chi-square analyses were used to assess differences in the prevalence of ever-tried smoking and 30-day smoking by gender and age. Univariate logistic regression analyses were performed to determine whether the three aspects of meanings of smoking were each associated with smoking behaviors, controlling for covariates. Stratified analyses were used to obtain separate odds ratios for 7th- and 11th-grade boys and girls because adolescent smoking prevalence increases with age, both in the United States and in China,[17,18] and because smoking is a gender-related behavior in China, where smoking prevalence rates for males are much higher than for females.[19] A multivariate logistic regression analysis was then run to determine adjusted odds ratios for the independent variables.

RESULTS

The demographic characteristics of the sample are shown in Table 1. The mean age of the respondents was 13.05 years for the 7th graders and 17.04 years for the 11th graders. The sample consisted of approximately equal numbers of boys and girls for both grades (49.3% girls in the 7th grade and 52.9% girls in the 11th grade). Roughly equal proportions of the sample came from each of the seven cities in China (ranging from 13.4% from Kunming to 15.1% from Chengdu).

Differences in Smoking Prevalence and Psychosocial Factors by Demographic Characteristics

Gender Differences. As shown in Table 2, there were large gender gaps in both ever-tried smoking and past-30-day smoking prevalence rates, with boys twice as likely to report having tried smoking at some time and five times more likely to have smoked in the past 30 days.

Age Differences. A steep age-related increase in both ever-tried smoking and past-30-day smoking was reflected in the sharp difference in smoking prevalence between the two grades. Eleventh graders were about three times more likely than 7th graders to have tried smoking at some time and roughly seven times more likely to have smoked within the past 30 days.

Association Between Meanings of Smoking and Smoking Behaviors

Association Between Personal Meanings and Smoking Behavior. As shown in Table 3, boys and girls who reported smoking as an act of making their own decisions (the first aspect of personal meanings) were approximately four to six times more likely to have ever tried smoking and to have smoked in the past 30 days than those who did not endorse this meaning of smoking. Among 7th graders, boys who reported experiencing smoking as an act of making their own decisions were approximately five to seven times more likely to have ever tried smoking and to have smoked in the past 30 days than those who did not endorse this meaning of smoking. For girls in the 7th grade, the ratio was even higher: those who perceived smoking as a path to autonomy were 7 to 10 times more likely to have ever tried smoking and to have smoked in the past 30 days. Among 11th graders, gender differences were not salient.

The second aspect of personal meanings of smoking—experience of smoking as a way to regulate one's mood and to relax—was significantly associated with an increased risk of ever-tried smoking and past-30-day smoking (Table 3). In general, among 7th- and 11th-grade boys and girls, those who viewed smoking as a way to handle their problems and to feel more energetic were approximately four to eight times more likely to have ever tried smoking and 7

Table 1

Demographic Characteristics of the Sample

	7th Graders, n = 2227 (47.1%)	11th Graders, n = 2497 (52.9%)
Mean age (SD)	13.05 (±0.87)	17.04 (±0.69)
Gender, n (%)		
Male	1129 (50.7)	1176 (47.1)
Female	1098 (49.3)	1321 (52.9)
City, n (%)		
Chengdu	328 (14.7)	393 (15.7)
Hangzhou	349 (15.7)	354 (14.1)
Shenyang	315 (14.1)	337 (13.5)
Wuhan	305 (13.7)	329 (13.1)
Harbin	345 (15.5)	377 (15.1)
Kunming	269 (12.1)	364 (14.5)
Qingdao	319 (14.3)	350 (14.0)

Table 2

Smoking Behavior by Demographic Characteristics

Variable	Ever-tried Smoking, %	Past-30-d Smoking, %	χ^2	*df*	*p*
Gender			196.54	1	<0.001
Male	33.3	15.0			
Female	15.8	3.4			
Age			58.04	1	<0.001
12–13 y (7th grade)	11.5	2.5			
16–17 y (11th grade)	35.8	14.9			
City			70.54	6	<0.001
Chengdu	32.9	15.3			
Hangzhou	25.3	8.5			
Shenyang	19.5	5.6			
Wuhan	26.6	9.5			
Harbin	27.7	10.4			
Kunming	21.3	8.0			
Qingdao	16.2	5.4			
Total	24.3	9.0			

Table 3

Univariate Adjusted Odds Ratios for Smoking Behavior, According to Meanings of Smoking Variables†

Meanings	Ever-tried Smoking		Past-30-d Smoking	
	OR	95% CI	OR	95% CI
		7th-grade Boys		
Personal				
Independence	5.13***	3.07, 8.58	6.58***	3.04, 14.24
Mood	3.92***	2.51, 6.13	7.60***	3.81, 15.16
Functional	1.82	0.86, 3.88	4.02**	1.44, 11.19
Social	8.89***	5.74, 13.75	10.61***	5.31, 21.22
		7th-grade Girls		
Personal				
Independence	7.06***	3.53, 14.09	10.02***	3.10, 32.36
Mood	8.26***	4.47, 15.27	7.35**	2.30, 23.50
Functional	4.13**	1.43, 11.96	3.42	0.41, 28.63
Social	5.66***	2.78, 11.51	4.99*	1.29, 19.37
		11th-grade Boys		
Personal				
Independence	3.72***	2.74, 5.04	5.42***	4.01, 7.33
Mood	4.52***	3.42, 5.96	8.52***	6.26, 11.59
Functional	1.97*	1.11, 3.49	2.88***	1.67, 4.97
Social	4.19***	3.16, 5.56	4.23***	3.17, 5.65
		11th-grade Girls		
Personal				
Independence	3.72***	2.57, 5.40	3.78***	2.14, 6.68
Mood	4.83***	3.59, 6.51	9.56***	5.40, 16.92
Functional	3.61***	2.06, 6.32	4.10***	1.86, 9.05
Social	2.21***	1.59, 3.08	2.09*	1.17, 3.72

† Adjusted by non-Chinese media, city, and personal allowance. OR indicates odds ratio; CI, confidence interval.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.0001$.

to 10 times more likely to have smoked in the past 30 days than those who did not endorse these meanings of smoking.

Association Between Functional Meanings of Smoking and Smoking Behavior. The odds ratios presented in Table 3 illustrate that significant associations were between viewing smoking as an aid in controlling weight and ever-tried smoking and past-30-day smoking. In general, for 11th graders, those who acknowledged smoking as a means to control weight were approximately two to four times more likely to have ever tried smoking and to have smoked in the past 30 days than those who did not endorse this view.

Association Between Social Meanings of Smoking and Smoking Behavior. Significant associations between social meanings of smoking, or the experience of smoking as a means to make interpersonal connections, and smoking behaviors were also observed (Table 3). Among both 7th- and 11th-grade boys and girls, those who reported that smoking was a means of making interpersonal connections were approximately twice as likely to have tried smoking and to report past-30-day smoking than those who did not endorse this view. In general, these ratios were higher for 7th graders relative to 11th graders and for boys relative to girls.

Odds Ratios Obtained From a Multivariate Logistic Regression Model. Table 4 shows the results of the multivariate logistic regression model. Age and gender were significantly associated with ever-tried smoking and past-30-day smoking. Being a girl was significantly associated with a decreased risk of ever-tried smoking and past-30-day smoking. City, preference for non-Chinese media, and personal allowance were also significantly associated with smoking behavior. In general, students who lived in larger and more industrial cities, who had higher levels of preference for non-Chinese media, and who had higher personal allowance were more likely to have tried smoking and to have smoked in the past 30 days compared with their peers who lived in other cities, who had lower levels of preference for non-Chinese media, and who had less personal allowance.

As shown in the multivariate logistic regression model in Table 4, the three aspects of meanings of smoking were significantly associated with ever-tried smoking and past-30-day smoking after controlling for covariates and partialling out the effects of each aspect, which shows that each of the variables was independently associated with smoking behavior. As shown in Table 4, the association between ever-tried smoking and mood regulation (one aspect of personal meanings of smoking) was stronger among girls than boys. However, the associations between social meanings of smoking and ever-tried smoking as well as past-30-day smoking were stronger among boys than among girls. In addition, the association between ever-tried smoking and social meanings was stronger for 11th graders than for 7th graders.

DISCUSSION

To our knowledge, this is the first study to explore what smoking means to adolescents in modern China. The main findings of this study are that all three aspects of the meanings of smoking—personal, functional, and social—were significantly associated with ever-tried smoking and past-30-day smoking. Students who scored higher on experience of smoking as an act of autonomy, a means of mood regulation, a way of obtaining

Table 4

Multivariate Logistic Regression Model Testing Associations Between Meanings of Smoking and Smoking Behavior†

	Ever-tried Smoking		Past-30-d Smoking	
	OR	95% CI	OR	95% CI
Main effects				
Personal meanings				
Independence	2.27***	1.80, 2.87	2.67***	2.02, 3.53
Mood	2.96***	2.41, 3.64	5.37***	4.07, 7.10
Functional meanings	0.88	0.60, 1.29	0.91	0.58, 1.43
Social meanings	2.07***	1.68, 2.56	1.60**	1.21, 2.11
Covariates				
Age	1.34***	1.28, 1.41	1.40***	1.29, 1.51
Gender	0.40***	0.34, 0.48	0.21***	0.16, 0.29
City	0.92***	0.88, 0.96	0.93*	0.87, 0.99
Personal allowance	1.14**	1.04, 1.25	1.23**	1.08, 1.40
Non-Chinese media	1.25**	1.10, 1.42	1.28*	1.04, 1.59
Interactions				
Gender × independence	1.05	0.65, 1.70	0.86	0.44, 1.69
Gender × mood	1.75**	1.16, 2.66	1.46	0.77, 2.79
Gender × functional meanings	2.16	0.99, 4.70	1.59	0.60, 4.25
Gender × social meanings	0.38**	0.24, 0.59	0.36**	0.19, 0.72
Grade × independence	0.95	0.83, 1.10	1.00	0.81, 1.24
Grade × mood	1.09	0.95, 1.24	1.13	0.92, 1.39
Grade × functional meanings	1.04	0.83, 1.29	0.97	0.72, 1.30
Grade × social meanings	0.82**	0.73, 0.94	0.87	0.71, 1.07

† Adjusted by non-Chinese media, city, and personal allowance. OR indicates odds ratio; CI, confidence interval.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.0001$.

control over one's life, and a channel for making social connections are more likely to self-report as ever smokers and the past-30-day smokers compared with never smokers.

Findings of the current study suggest that among those Chinese adolescents who reported having smoked, smoking may mean personal choice and autonomy. These findings are consistent with research conducted in the United States in that smoking meant rebellion and resistance to authorities among those adolescents who have tried smoking and who are currently smoking.[2,5] Much like their Western counterparts, Chinese adolescents may also be concerned with a sense of autonomy.[20,21] The need for autonomy among Chinese adolescents might also be elevated by the preference for Western media. It is worth noting that the strength of the autonomy-smoking association is stronger among 7th graders than 11th graders. Given the traditional norm that smoking is taboo for children, cigarette smoking may represent a stronger expression of rebellion to younger Chinese adolescents than to older ones.

The findings of this study indicate that smoking provides a way of regulating negative mood to those Chinese adolescents who have tried smoking and who are currently smoking. In addition to the usual pressures from family, schools, and peers, adolescents in modern China may be experiencing unprecedented economic, social, and cultural changes. Feelings of uncertainty and worries about parents' unemployment, increased social and economic disparity, and unsuccessful adjustment to these life changes may also lead them to view smoking as a way to alleviate unpleasant affect and to regulate distressed emotions, just as their counterparts in the United States do.[22–24]

The evidence from this study suggests that smoking is imbued with functional meanings for Chinese adolescent smokers. Some adolescents saw smoking as a way to reduce hunger and control weight. This is consistent with previous research findings that dieting and weight concerns increase the likelihood that adolescents, especially girls, will smoke.[25–28] Under the influence of Westernization, Chinese adolescents may be even more eager than in the past to find ways to avoid weight gain.

Adolescents in this study also perceived smoking cigarettes as a way of making friends and maintaining interpersonal relationships. This is consistent with previous research done both in China and in the United States.[18,29,30] Smoking has long been viewed as a social behavior in China. In this social environment, sharing cigarettes and smoking with friends may connote peer acceptance, group belonging, masculinity, and friendship. Chinese adolescents may pick up smoking because they experience it as a way to satisfy the need for interpersonal connections.[31–33]

Gender norms for smoking in China have traditionally differed from those in the United States in that tobacco usage has largely been confined to males.[34,35] Although the significant gender disparity in smoking prevalence observed in this study is consistent with previous evidence,[18,36] the associations between meanings of smoking and smoking behaviors in this sample suggest that norms are changing. A strong association between the expression of autonomy and smoking was observed among 7th-grade girls. One plausible explanation may be that Chinese girls, because of the traditional perception of smoking as a socially acceptable behavior for men but not for women,[32,37] are more influenced by the experience of smoking as an act of autonomy. In addition, the association between weight concern and smoking is stronger among Chinese girls than among Chinese boys, especially among older adolescents (11th

graders), the age when more female students would pick up smoking. Smoking may mean glamour and slimness to modern Chinese girls who have been exposed to Western media. This further suggests that they may be willing to violate the traditional taboo for the sake of enhancing self-image and a sense of gender equality.[37,38] Thus, we may anticipate that the gender disparity in smoking prevalence will diminish among Chinese adolescents.

Another gender difference was observed in this sample. For both 7th- and 11th-grade boys, the association between seeking interpersonal connections and smoking is stronger than for girls. Sharing cigarettes with others is perceived as a gesture of hospitality and a symbol of willingness to get to know others among men in China. It might be that Chinese boys tend to follow their adult models.

Limitations

Several limitations related to this study need to be addressed. First, the list of meanings that the respondents had to choose from was developed in the United States rather than China. The assessment may have missed meanings that are important to Chinese youth. In the questionnaire, we did not have a place for respondents to write in other meanings. Although our questions were carefully translated into Chinese and then back translated into English, we cannot rule out the possibility that some items might have been misunderstood. Second, although this sample is representative of urban areas in China, the results may not generalize to the approximately 70% of teens in China who live in rural areas. To generalize over broader areas of China, it will be important to confirm the findings with other samples of Chinese adolescents.

Third, the study is cross sectional, which does not allow us to establish the direction of causality between meanings of smoking and adolescent smoking behavior. It may be that smoking leads to the feelings of independence, competence, and connections with others rather than the other way around. Longitudinal studies are needed to determine the direction of causality.

SO WHAT? Implications for Health Promotion Practitioners and Researchers

Our results suggest that personal, functional, and social meanings of smoking are associated with smoking behavior among Chinese adolescents because smoking may suggest autonomy, competence, and social relatedness. Combined with other research conducted in the United States, there seems to be support for the assertion that smoking connotes rebellion and resistance to authority among those adolescents who have tried smoking and who are currently smoking.[2,5] Much like their Western counterparts, Chinese adolescents are concerned with a sense of autonomy.[20,21] Smoking prevention programs in China require new strategies to incorporate meanings of smoking in order to help adolescents develop strategies to express their needs for autonomy, competence, and social connections without risking their health.

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