Research Report

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The Age Prevalence of Smoking among Chinese Women: A Case of Arrested Diffusion?

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A Case of Arrested Diffusion? *

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ABSTRACT

The smoking prevalence by age of women in China is distinct from most other countries in showing more frequent smoking among older women than younger. Using newly developed birth cohort histories of smoking, the authors demonstrate that although over one quarter of women born 1908-1912 smoked, levels of smoking declined across successive cohorts. This occurred despite high rates of smoking by men and the wide availability of cigarettes. The analysis shows how this pattern is counter to that predicted by the leading theoretical perspectives on the diffusion of smoking and discusses how it arose out of the special culture of gender relations in China, rather than from particular socio-economic or political events. That a similar pattern of smoking is evident in Japan and Korea, two countries with strong cultural affinities to China, is used to buttress the argument.
I. INTRODUCTION

Tobacco use is often referred to as a worldwide epidemic, because of its broad diffusion among many groups within societies, its spread across societies, and its many direct health risks (WHO 2009; Lopez, Collishaw and Piha 1994). Among the many topics under study, the level of smoking in China and the potential health consequences have come under increasing scrutiny. China is now the largest consumer and producer of tobacco in the world with 350 million smokers accounting for 37% of the world’s cigarette production. (Shafey 2009:22). Tobacco related diseases in China are estimated to cause from two-thirds of a million deaths (Gu et al. 2009) to one million deaths a year (Liu et al. 1998) in recent years. Two out of three Chinese men were current smokers according to the 1996 national prevalence survey, and that proportion varied little between the ages of 25 and 70 (Weng and Niu 1998).

By contrast to the men, only 4% of women in China younger than age 70 were reported as ever smokers in the 1996 survey. This pattern is similar in both magnitude and the degree of gender differential to those observed in a number of non-western countries, as reported by Waldron et al. (1988) and Morrow and Barraclough (2003a, 2003b). Though noted in passing in several places, this low level of smoking prevalence has generally escaped detailed scrutiny. Smoking prevalence by gender in China also resembles the patterns found in Korea and, to an extent, Japan, two countries with strong cultural and socio-economic affinities.

Additionally, in the case of China and the other East Asian countries, the low current level of female smoking masks a complex age structure and history not generally found elsewhere. More specifically, the age distributions suggest that smoking among women in these countries was at a much higher rate earlier in the 20th century than later, and that younger cohorts of women did not adopt smoking at anything like the rate of older women. This East Asian pattern, which appears unique, runs counter to that predicted by the prevailing theories on how levels of adoption and use advance over time and is particularly surprising in light of the long history of tobacco use in China, Japan, and Korea. How do we account for this arrested diffusion of smoking among women, and what do these insights suggest for future levels of consumption?
In the next section we describe the distinctiveness of the Chinese female age distribution (and that of Japan and Korea) by comparing it to several European countries and the United States’ patterns over time. To gain more historical depth we then present for the first time birth cohort estimates of smoking for all of China and analyze these data in light of levels expected according to current theoretical perspectives on the diffusion of smoking. Lastly we explore the history of smoking in China (and to a lesser extent Japan and Korea) and the socio-economic and cultural forces operating, to suggest why the current pattern emerged and how these insights add to our theoretical understanding of patterns of adoption, and assist in gauging future trends.

II. AGE PATTERN OF SMOKING IN CHINA COMPARED TO OTHER COUNTRIES

The age profile of smoking among the more economically developed countries is generally a reflection of the timing and patterns of adoption of tobacco. In many countries in which smoking has become widespread, especially those with early adoption, smoking is first adopted by younger men, diffusing somewhat to those older, but particularly taken up with increasing frequency by successive male birth cohorts in their late teens and early 20s. This is followed with some delay by adoption by successive cohorts of younger women. This produces an age-graded profile of smoking during the latter half of the 20th century in which the proportion of smoking is inverse to age (from ages 20 or so and older). It is also common to find the ratio of male to female smoking proportions at each age to be greater at older ages and closer to parity at the younger ages, as successive cohorts of women adopt at a higher rate than their predecessors (Pampel 2001). (Greater awareness of the health dangers of smoking and efforts by many countries to curb smoking have altered these age patterns significantly in a number of places, depending on the cessation patterns by age.)

The data in Table 1 for the United States (National Center for Health Statistics 1999) from 1965 to 2005 illustrate these patterns. In 1965, the age prevalence of smoking is much more skewed among women than men, and there is less gender differential at younger ages than at older, so that the ratio of male to female proportion smoking increases sharply with age. In 1983-85, female smoking is more on a par with male smoking at many ages, so that the ratios are generally reduced, and by 1995, there is almost parity in the ratios and distributions.
Table 1. United States: Percent of Men and Women Smoking by Age and Male to Female Ratio

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Source: National Center for Health Statistics (1999)

For countries in which women have adopted smoking more recently, as in Italy and Spain, a sharp gradient by age is observed as the increase in female smoking occurs disproportionately among younger women. In Spain, for example, in 1987, a survey in Catalonia revealed that 41% of those aged 25 to 34 smoked, compared to 14% of those aged 35 to 44, and less than 5% of those aged 45 or older (Nicolaides-Bouman et al. 1993).
In contrast to these patterns, the data for China, Japan, and Korea shown in Tables 2 and 3 reveal a pattern in which female smoking prevalence is higher at older ages than younger in each country, suggesting that older women in these countries adopted at a higher rate than their younger counterparts. In Japan, the most recent years show an upsurge in smoking at younger ages (not unlike Spain) which is not apparent in China and Korea so that the dominance of the older age groups observed for 1965 and 1975 no longer holds. These differences will be discussed further below.

Table 2. China: Percent of Men and Women Smoking by Age and Male to Female Ratio

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Source: 1996 China National Prevalence Survey of Smoking Patterns

In contrast to the pattern for women, the age distribution for men is much more rectangular, with high proportions smoking at each age. As a result, the ratio of male to female smoking ratio is much higher at younger ages than at older ages, in contrast to the pattern for the United States shown in Table 1.
Table 3. Percent of Men and Women Smoking by Age in Japan and South Korea

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Sources: Japan Health Promotion and Fitness Foundation, 2008; Korean Gallup Organization, Korean Tuberculosis Association
III. BIRTH COHORT ANALYSIS OF CHINESE SMOKING PATTERNS

Though the age distribution of smoking prevalence at one or more points in time provides valuable information as to differential behavior among the birth cohorts, it provides only limited historical perspective. If two age groups differ in prevalence, one does not know whether they differed in rates of adoption or cessation or both, and how ages of initiation may have differed. Nor does one know how prevalence levels evolved over time. Birth cohort histories of smoking can be constructed when one has individual data on current smoking behavior, date of initiation and date(s) of cessation. These data provide a much richer history which is particularly useful for aligning the trends and patterns of smoking with the social, economic, and cultural forces ongoing in the country.

The data used are derived from the 2002 Chinese Longitudinal Healthy Longevity Survey (CLHLS) data which covers 22 out of China’s 31 provinces. The 2002 wave includes 16,064 Chinese ages 65 and older as of that date. Details of the survey including its availability for download can be obtained online (Chinese Longitudinal Healthy Longevity Survey 2009). Our analysis of the 2002 CLHLS data is performed on a sample of 11,045 respondents born between 1908 and 1937. We stratify this sample by rural-born (N=9171) and urban-born respondents (N=1874). The survey asked respondents if they have ever smoked, the age they began smoking, and the age they quit smoking. A number of cases (152) were dropped due to conflicting responses to these three questions or to missing information about birth place.

The technique for calculating birth cohort histories is described by Harris (1983). In addition to information on smoking status, age of initiation, and age of cessation (if appropriate), the calculation requires estimates of the differential survivorship of smokers and non-smokers. In our calculation we make use of the life tables generated by Banister and Hill (2004), the World Health Organization, and the United Nations for the basic survivorship functions applicable to China. We then use the differential in survival between smokers and non-smokers provided by Hammond (1966), adjusted slightly to fit our understanding of the Chinese case.1

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1 The foregoing description is taken from Lowry and Hermalin (2010), a companion article which presents a descriptive analysis of the birth cohort data, including results by region, education, and information on age of initiation and trends of cessation.
The key results of this analysis are presented in Figures 1 and 2 for male and female birth cohorts of urban and rural origin born from 1908 through 1937. Collectively these cohorts have lived through a tumultuous century in China's history, marked by extraordinary social - economic and cultural and political changes exemplified by the creation of the Chinese Republic (1911) the Sino-Japanese war, the Second World War, the Chinese Civil War, the formation of the People's Republic in 1949, the Great Leap Forward and the Cultural Revolution. Figures 1a and 1b, which show the prevalence of smoking for cohorts of urban and rural women, dramatically explicates the simple age distribution presented in Table 2. Among those of rural origin, the oldest women, those born between 1908 and 1912, reached a peak prevalence of smoking of over 25% (at ages 50-54) and the level of smoking declined quite sharply and regularly with each succeeding cohort, so that the peak level for the two youngest cohorts (those born 1928-37) was about 11%.

Among urban women the broad pattern is similar but the decline from cohort to cohort is not as regular. Like their rural counterparts, those born 1908-1912 show the highest prevalence, 27% (at ages 50-54), and the 1913-1917 cohort shows a sharp drop-off from that level. But the 1918-22 cohort almost matched the oldest cohort in level and the 1923-27 cohort slightly exceeded the 1913-1917 cohort at its peak. As with rural women, the two youngest cohorts displayed much lower smoking levels at each age and peaked at about 12%.

The patterns for male smoking shown in figures 2a and 2b are quite different. For rural men, the age curves of prevalence across birth cohorts are almost identical, with peaks between 74 and 78% and only a slight dip in peak prevalence to 72% for the youngest cohort. For urban men the age curves are also remarkably similar, with smoking prevalence peaking in a narrow range of 66 to 70%.
Figure 1a. Mortality-adjusted Smoking Prevalence for Birth Cohorts by Five-Year Intervals: Rural Women

Figure 1b. Mortality-adjusted Smoking Prevalence for Birth Cohort by Five-Year Intervals: Urban Women
Figure 2a. Mortality-adjusted Smoking Prevalence for Birth Cohorts by Five-Year Intervals: Rural Men

Figure 2b. Mortality-adjusted Smoking Prevalence for Birth Cohorts by Five-Year Intervals: Urban Men

Please note the difference in scale along the Y-axis compared to Figures 1a and 1b.
These cohorts reveal that quite early in the century, smoking was widespread among men with roughly 7 out of 10 using tobacco at peak ages of consumption. This is not surprising given China's long involvement with tobacco and early use as we discuss below. This level and pattern of tobacco use remains relatively constant throughout the century despite all the socioeconomic and political changes China experienced. At the same time, the experience of women is quite different. More than one out of four women of the oldest cohorts were using tobacco, but despite the high level of use among men, the widespread availability of cigarettes and the rapid social and economic changes under way, the prevalence of smoking tended to decline with each succeeding birth cohort. This divergence is counter to that experienced almost everywhere else and to the theoretical perspectives often adduced to explain observed smoking patterns. We review these perspectives as prelude to examining the reasons for the distinctive East Asia pattern.

**IV. THEORETICAL PERSPECTIVES ON THE PREVALENCE OF SMOKING**

The distinctiveness of the East Asian pattern calls into question the applicability of the dominant theoretical perspectives on the spread of smoking and suggests the need for a more nuanced understanding of the forces at work. The key theoretical perspectives employed to discuss the spread, level, and prevalence patterns of tobacco use are those of epidemic, diffusion, and, when accounting for male-female differences, issues of gender equality.

The popular meaning of the word “epidemic” refers to a contagious disease that spreads rapidly but it can also refer to any fad, fashion, or practice that is general and spreads widely and rapidly. It is clearly in this second sense that the word is often invoked to describe both the extensive geographic reach of tobacco use and the substantial portion of the population involved. As such, the concept offers little by way of explanation but rather focuses on documenting the spread, level, and trends of use among the population and its subgroups. Lopez et al. (1994) for example posit a “descriptive model of the cigarette epidemic” and define four stages - from two to three decades each in length - during which the prevalence of cigarette consumption rises rapidly from a low level for men to a peak at the end of stage 2, and then starts a decline, somewhat rapidly in stage 3, and more gradually in stage 4. Women’s prevalence of smoking is assumed to lag behind that of men by one or two decades, but to increase rapidly in stage 2 before starting a gradual decline in stages 3 and 4. But as the authors note, the model they
describe is a very general categorization and the “exact timing, duration, and magnitude of the epidemic will vary significantly from one country to another” (Lopez et al. 1994:245).

The diffusion of innovations perspective attempts a more explanatory approach by subsuming tobacco adoption and use under this broader set of models which seek to track “an innovation, defined as an idea, practice, or object perceived as new by an individual or other relevant unit of adoption, which is communicated through certain channels over time among the members of the social system” (Rogers 1976:292). As Wejnert (2002) notes, such communication and influence alter an actor’s probability of adopting an innovation and in a broad sense, studies of diffusion provide an empirical and quantitative basis for developing more rigorous approaches to theories of social change.

Diffusion of innovation models call attention to the rate at which various subgroups within a population adopt and terminate their use of tobacco. The earliest models pointed to the younger and more elite groups as leading the way in adoption, with those in lower socio-economic groups following. But with greater awareness of the dangers of smoking, it is expected that the more educated will terminate earlier than the less educated and also adopt less frequently, eventually changing the social class prevalence relationship (Lopez et al. 1994). With regard to gender, it is generally asserted that men take up smoking first and the extent to which women follow depends on their status within society, the level of economic development, and specific cultural aspects (Waldron 1991, Nathanson 1995, Pampel 2001).

Though the ordered pattern of smoking adoption observed in many countries, plus the extensive advertising and marketing of cigarettes that accompanied rising prevalence is consistent with the diffusion model, detailed empirical testing is often lacking. As several critiques make clear there are many structures and interactions that should be examined to understand the nature and extent of diffusion. A detailed examination of the role of diffusion processes in bringing about fertility change in developing countries (National Research Council 2001) discussed many of these, including: the nature of relevant action groups and social networks that an individual is involved with, examining the specific content of interpersonal interactions, understanding conditions that promote communication or delay adoption such as the homogeneity or heterogeneity of groups, testing whether individual adoption is a function of the adoption by others, and ethnographic research to determine the role of cultural systems.
Rogers (1976: 294) in his review paper sounds a similar note in citing lack of attention to process and “shortchanging of structure” among the conceptual/methodological biases associated with diffusion research. More generally, Wejnert (2002) stresses that a model of diffusion must take into account the nature of the innovation, the characteristics of the innovators, and the environmental contexts, reflecting among other things the societal culture. Her review notes cases where cultural factors hindered the adoption of an innovation, as in Japan where, citing Straub (1994), she describes how Japanese companies more frequently adopted FAX technology than e-mail, which was the reverse of the American pattern. Straub attributes this to the more official character of FAX, which was compatible with the stress on formalized social relations in Japan, while the more informal nature of e-mail was more congruent with American culture. Another dramatic instance of the role of social norms in blocking the adoption of innovation cited by Wejnert is the analysis by Rogers (1995) of the general refusal of the Peruvian village of Los Molinas to adopt the practice of boiling drinkable water because it conflicted with their norm of serving such water only to sick people. These examples of the role of social norms influencing the adoption of an innovation are particularly relevant for our understanding of the Chinese pattern of female smoking as we discuss below.

The relatively rapid increase of smoking among women in the more economically developed countries after World War II, is often credited to improvements in gender equality that were occurring at the same time (Nathanson 1995). Pampel (2001), however, finds in a 16 country multilevel study testing measures of gender inequality against those of diffusion of smoking, that the key diffusion indicator is significant and much more substantial than the gender equality measure in accounting for the growing equality of male and female prevalence. The diffusion measure he uses is the number of decades since cigarette consumption reached 50% of its eventual peak. It is designed to reflect the stage of smoking prevalence for men and women, based on the observation that women take up smoking later than men and for countries with long tobacco experience, male prevalence starts to decline so that male-female differences are diminished, in contrast to countries at an earlier stage, where men are still close to their peak prevalence and women are at an early stage. As such, the diffusion indicator is more a descriptive summary of typical trends in observed use—following closely the Lopez et al. (1994) ”epidemic” model described above—rather than reflecting any set of individual or societal actions. Waldron (1991) expresses a similar concern about the generality of the diffusion model
in discussing the limitations of Ferrence’s (1988) diffusion analysis of gender differences in smoking to capture many of the key factors operating.

Despite their long history of use, documented below, the prevalence patterns by gender in China, Japan, and Korea are at a far remove from those deemed typical by the models employed by Lopez et al. (1994) and Pampel (2001) for countries with such experience. In each of these countries, male prevalence of smoking rose rapidly, reaching 60% or more quite quickly, but the female prevalence of smoking became arrested, with successive female cohorts declining in level of adoption, and the male to female ratios of smoking increasing at the younger ages in contradistinction to the expectations of the models. Understanding why a major area of the world possesses such a distinctive profile can add to our general understanding of the dynamics of tobacco adoption and use and perhaps assist in efforts at tobacco control and this is the focus of the next two sections.

V. EXPLAINING THE EAST ASIAN SMOKING PATTERN

A. History of Adoption in China, Japan, and Korea

The use of tobacco in China, Japan, and Korea was well established quite early in the 17th century, and evidence of its introduction can be traced to the 16th century. In China, the plant appears to have been introduced to Southern China via the Philippines and to northern China by the Manchus, and via Korea and Japan. There are reports of tobacco being cultivated in Fujian province by 1590 and being distributed to other provinces. (Laufer 1924; Brook 2004)

In Japan, after its introduction by the Portuguese in the 1590s, tobacco use became quickly widespread in the early decades of the 17th century, to the point that there were edicts promulgated by 1615 banning its use in order to prevent fire (Laufer 1924). Not long after its arrival in Japan, the Japanese introduced tobacco into Korea, where it was quickly highly regarded. Dutch observers in the 17th century report that smoking was general and indulged in by both sexes, as well as by young children (Laufer 1924).

Reports of visitors as well as local observers and available data point to widespread use of tobacco in China at an early date. Brook (2004) reviews several manuals and discussions of tobacco from the 17th century on, and notes that although there was reference to both its ill effects as well as desirable qualities in the earliest material, the idea that smoking was a danger to health was largely absent in the literature after the 17th century until its reappearance in more
recent medical literature. He cites the 18th-century author, Lu Yoa, of a smoking manual (Yanpu) that "in recent times there has not been a gentleman who does not smoke and “even women and children all have a pipe in their hands." Brook (2004: 88-89) cites an English observer writing in 1878 who noted, “it is the fashion for girls at even eight or nine years of age to have as an appendage to their dress a silken purse or pocket to hold the pipe and tobacco to which they aspire, even if they do not already use them.”

A number of rules of etiquette of how and when to smoke arose at an early date, and smoking practices differed across social class and gender. Brook (2004:89), citing what he terms “the pharmacological thinking of that early period,” states that women being of the ‘yin’ gender had to protect themselves against the excessive ‘yang’ of tobacco and therefore were advised to avoid hot smoke. In practice this meant smoking pipes with longer stems or, towards the end of the 18th century, using a water pipe which produced the coolest smoke and was therefore deemed to be more appropriate for the delicate nature of women. According to the customs prevailing in the 19th and early 20th century a woman smoking at that time would typically have taken it up after marriage and practiced it as a private leisure activity within the confines of her own home.

Although pipe smoking was the traditional means of tobacco use in China, cigarettes made rapid inroads. In 1858, the Treaty of Tianjin allowed cigarettes to be imported into China duty-free and in 1889 – 1890 the American Tobacco Co. and the British American Tobacco Company entered the Chinese market. Shortly thereafter a number of domestic tobacco companies were established. Goodman (1994) reports an estimate that 1.25 billion cigarettes were consumed in 1902, 7 billion by 1910, and that this number grew to 87 billion by 1928.

A similar rapid conversion to cigarettes occurred in Japan. Goodman (1994) reports that this conversion occurred by 1920 if not earlier. He reports that Japan was one of the first foreign markets to be targeted by W. Duke and Sons and the American Tobacco Company and that British and American companies bought stakes in Japanese manufacturers at an early date. All these interests were liquidated however when the Japanese government formed a state tobacco monopoly in 1904 (Goodman 1994). Similarly, the Korean government set up the Korea Ginseng and Tobacco Monopoly in 1899, which became the sole outlet for Korean farmers to sell their product as well as the sole source of cigarettes and other forms of tobacco for consumption (KT&G).
B. Norms and Counter Norms about the Place of Cigarettes

All societies develop rules and norms that distinguish some behaviors as more appropriate for females than males, and in many these rules as well as access to resources are largely controlled by males. As Waldron's et al. (1988) analysis of non-Western countries shows, tobacco access and use became gender patterned in many of these.

Chinese culture traditionally has been sensitive and explicit with regard to gendered behavior. Numerous objects and actions are regarded as ‘yin’ or ‘yang’, a concept embedded in Taoist philosophy and reflected in many dimensions of daily life. In addition the appropriate behaviors for women as daughters, wives, and mothers are salient in Confucian philosophy, which has been influential in China, as well as Japan and Korea, over much of their history. It is not surprising therefore that gender differences in pipe smoking practices emerged quite early in China's history with tobacco. The distinction, described above, between long and short pipes and hot and cold smoke with regard to pipe smoking demonstrated how nuanced gender issues could pervade proper smoking behavior as well as many other aspects of Chinese society.

The rapid rise of cigarettes also appeared to trigger an evaluation of their proper place in society, particularly in relation to its use by women vis. a vis. men. Nor was China alone in formulating rules and norms with regard to this new, pervasive form of tobacco use. In the United States, for example, several states had outlawed the sale of cigarettes by 1900 and by 1909, 15 states had passed laws banning its sale. In 1908, New York City passed legislation forbidding women to smoke in public (Borio 2003). More generally, Waldron (1991) in her analysis of gender differences in smoking cites social disapproval of women smoking in the early 20th century as a major cause of the differential. “Women who smoked were considered to be disreputable" (Waldron et al. 1991:993) and as recently as 1966, a survey in the United States found that among women who never smoked, almost 17% said it was because it was not quote ‘socially acceptable’. But Waldron notes that in the United States and Great Britain and other Western countries, increasing social acceptability of women smoking, particularly after midcentury, has served to diminish gender differentials in smoking prevalence, though some evidence of disapproval persists. Waldron et al. (1988:1272) note that in several non-Western countries cigarettes became proscribed for women, while traditional forms of tobacco use did not face as strong gender sanctions.
The 1930s seem to be the crucial decade in China during which several socio-economic and cultural forces came together that served to define the appropriate gender behavior with regard to smoking, in particular the consumption of cigarettes. There were forces that both promoted and constrained the use by women.

From the standpoint of marketing, by the 1930s cigarettes became a mass consumer good available to urbanites as well as peasants at a low price, as a result of mass production. There was a great proliferation of brands, domestic and foreign, many of them containing morphine or heroin as a means of attracting former opium users (Zhou 2004:165). A large number of the brands featured images of beautiful Chinese woman in alluring poses, but as Zhou (2004:166) argues, the intent and meaning of these images and the accompanying extensive advertising were designed more to signal the modern Chinese woman at home in the rapidly industrializing society than to serve as an attractive fetish object for men. As women became more involved in urban employment and public life, the expectation was that they would eschew the wasteful practices of the previous generation which involved leisurely indulgences at home including pipe smoking.

At first glance, the emerging image of the new Chinese woman, coupled with the aggressive marketing of cigarettes might have been expected to attract increasing numbers of women to adopt this form of smoking. Existing data are not detailed enough to detect whether there was an upsurge of female smoking in the 1930s. The oldest birth cohort we can observe is that of 1908-1912 who would have been at key adoption ages during the 1930s. As noted in figures 1a and 1b this cohort shows a very rapid rise in adoption with age and displays well over 20% prevalence before the end of the decade. This compares with about 70% prevalence for the same birth cohort of men. These levels and the male-female ratio appear typical of the pattern Lopez et al. have hypothesized midway through stage 2 for the countries that have moved through the posited epidemic model (figure, page 246). But the continuing rise in female use and the decline in male prevalence predicted by the model did not occur in China and there appeared to be significant socio-economic and cultural forces at work to counter the attractiveness of the mass marketing. The norms that dictated that the delicate nature of women required a cooler and less strong pipe smoke carried over to characterization of cigarettes as being too coarse and damaging for women and especially harmful to pregnant women.
Other forces seemed to generate a further divide between male and female smoking practices. The growing industrialization and urbanization of the country and rising nationalism led to a number of new attitudes. Smoking moved from the private venue to the more public and this required new rules. Smoking among men was accommodated by the formation of special clubs and retreats in which men could enjoy their newfound leisure (Zhou 2004:162). More generally, the exchange of cigarettes in many social situations – as gifts, as a gesture of friendship, at dinner banquets, when asking a favor, or as tips for service – became integral to the male culture of smoking (Kohrman 2008; Cheng et al. 1990). Reflecting the pervasiveness of these practices, Cheng et al. (1990) report that some nonsmokers in their study admitted to an “occasional social smoke” and a supervisor of a 2004 family survey reported that it was not uncommon for male interviewers to offer their male respondents a cigarette at the start of an interview to gain cooperation and build rapport. (Personal observation reported to the authors.) At the same time, part of the emerging image of the new Chinese women was not only to forego the wasteful practices of the previous generation, but also to avoid emulating the decadent West, marked in part by women's smoking in public.

Note should also be taken of the New Life Movement initiated by Chiang Kai-Shek in 1934 which sought to foster greater morale and discipline among the population by appealing to the Confucian virtues of decorum (li), righteousness (yi), honesty and integrity (lian), and sense of shame (chi) (deBary 1964:139). In addition to addressing official corruption, lack of discipline and apathy there were appeals to greater personal hygiene and physical training, and injunctions against both tobacco and opium smoking, dancing, and other behaviors considered improper or unhygienic. Enforcement of the many rules promulgated was under the leadership of the Blue Shirts, an elite corps developed by Chiang in the early 1930s and patterned after similar groups in Italy and Germany (Pakula 2009). Though the rules applied to both men and women it is possible that they were more effective in curtailing public smoking by women, especially since Madame Chiang Kai-Shek took an active part in this program and many of the activities were promoted by women’s working committees and other groups she headed up.

These countervailing forces seemed to have sharply curtailed the diffusion of smoking among women that seemed in evidence with the 1908-1912 cohorts. The birth cohorts of 1913-1917, who would have reached prime adoption age around 1940, show a sharp drop off in smoking (Figures 1a and 1b) from the 1908-1912 cohorts. The inference from these patterns is
that by the late 1930s a strong normative prohibition against women’s smoking had taken hold in China. This impression is reinforced by the reports of women in the 1996 national prevalence survey. Of women smokers 60 to 69 years old (the oldest group observed in that survey) over 30% said they never smoked in public and another 40% said they sometimes smoked in public. The strength of the norm against cigarettes is also suggested by the fact that over 20% of all female smokers in that survey reported that they smoked a Chinese pipe.

It is also worth stressing that the smoking prevalence among women did not advance after the formation of the People’s Republic of China in 1949 and at first glance this is surprising. Under Mao and during the Cultural Revolution there was ostensibly a very clear program for women to take a more equal part in the occupational structure, working side-by-side with men in a variety of jobs, and in the economy more generally, and the heavy smoking patterns of the leadership might be expected to enhance smoking by both men and women. Mao’s famous pronouncement that “women hold up half the sky” was supposed to signal a new era of gender equality. Some observers of the Cultural Revolution point out the unisex aspect that prevailed- with women wearing the same uniforms and clothing as men as example- but several analysts have shown that the strong rhetoric was not fully matched by action (Yang 1999; Honig 1985). Precedent was given to steps that promoted economic growth even if these came at the expense of gains for women. Despite these reservations there were notable advances in gender equality and it speaks to the entrenched nature of the norm against female smoking (especially in public) that even the substantial shift in the ideology and practice of gender equality produced no noticeable increase in female smoking prevalence as revealed in Figures 1a and 1b.

Some analysts suggest that many of the urban young men sent to the countryside during the Cultural Revolution were introduced to smoking there by their rural counterparts, and this led to some upsurge in smoking prevalence in urban areas after they returned, while young women generally would not face similar social pressures to smoke (Cheng et al. 1990). But Honig (2003) states that officially there were strong bans against smoking on the part of the youths being ‘re-educated’, and she notes incidents in which both leaders and youths were punished when they were caught smoking.

The data in Table 3 suggest that the smoking behaviors of the female birth cohorts in Japan and Korea resemble those of China, and this is confirmed by the birth cohort analyses.
carried out by Marugame et al. (2006) and Park et al. (2005) respectively. In each country there was a rather steady decline in the prevalence of smoking from the oldest cohorts to the youngest cohorts observed, which closely parallel the time span covered by the analyses in Figures 1 and 2, pointing to an ongoing social environment in which women increasingly refrained from or were discouraged by rules and customs from taking up tobacco use.

Given the tumultuous history of China over the 20th century, we expected at the outset of our research that the particular female age distribution of smoking in China might be traced to one or two particular events in that country. The similarity of the smoking patterns in Korea and Japan call that assumption into question. To account for the resemblance across the three countries requires either identifying particular events in each country that would have arrested the diffusion of smoking among women, or seeking a broader common factor. We are not in a position to trace the history of Japan and Korea in the same detail as China but we note one or two relevant developments. In Korea, as in China, along with urbanization and industrialization there also emerged the concept of the modern Korean woman who would not follow the non-productive pathways of her predecessors nor would they adopt the decadent practices of the West with regard to smoking (Yoo 2008:74-82).

In Japan, note might be taken of the severe rationing of cigarettes during World War II to insure sufficient supply for the armed forces and severe post-war shortages (Marugame et al. 2006). This may have curtailed use by women and limited initiation of smoking. The emergence after 1945 of married women as the stay-at-home managers of their family affairs and protectors of their children’s welfare and advancement provided a distinct world for women away from the smoking culture of their husbands (Vogel, 1978). This was reinforced by the “New Life Movement” in which various corporations and government offices developed outreach programs directed to women stressing household management and child rearing practices (Gordon 1997).

As against the coincidental occurrence of specific societal factors hindering smoking adoption by women, we believe that the observed gender differentials were more due to the emergence of similar norms within each country. As noted above, the introduction of cigarettes and their extensive promotion led many countries to deal with their acceptability and to develop rules as to their proper use. As with other innovations, widespread adoption requires a suitable fit between the nature of the behavior or structure being diffused and existing cultural patterns. For
these East Asian countries, Taoist and Confucian cultural ideals on the nature of men and women and appropriate behavior for each sex led to the development of norms that gave free rein to the use of cigarettes by men – even making it an integral part of many social occasions -- but sharply curtailing its acceptable use by women. These norms appear to have been become strongly entrenched and to have withstood, until recently, many major social economic and political changes these countries have faced.

As with many rules firmly embedded in the social fabric, the few references to them we have encountered state them as accepted facts or common knowledge, and do not pursue their origin or give any indication of any tensions that occurred during their formative years. For example, commenting on the gender differential in smoking prevalence in China, Cheng et al. 1999 (160) state:

In young women, however, smoking has traditionally been considered distasteful and socially improper.

For Japan, Marugame et al. (2006:126) say:

Before WWII, Japanese society did not accept smoking by young women. Therefore, Japanese women began smoking later in life. This was especially true for older generations.

For Korea, Cho et al. (2008:616) say:

Under the influence of Confucianism, which emphasizes patriarchal family systems and high levels of control over women, smoking has not been considered to be an acceptable habit of women. Even today, Korean women often feel strong social pressures against smoking in public.

**VI. IMPLICATIONS FOR THEORY AND FOR TOBACCO CONTROL EFFORTS**

The history of women's level of smoking in these countries calls into question the generality of the models of diffusion and epidemic often noted in the literature, whereby smoking is taken up first by younger men and then spreads to women. And although Lopez and others sometimes acknowledge that this model may not apply to all countries and times, its lack of fit to a major region of the world has received little attention. More detailed analysis of the exceptions to the general pattern can deepen our understanding of the factors which influence the adoption and use of tobacco in different settings.
The patterns observed in East Asia can also contribute to a deeper understanding of gender relations. The persistence of gender-based norms about smoking despite the rapid ongoing social economic changes and advances by women in the labor force and public spheres of life demonstrate how rules that allow or encourage equality in one sphere may not carry over to others. In China, and perhaps Korea, even the way the modern woman was defined served to reinforce the norm against female smoking.

The efforts at tobacco control in many countries around the world, leading to many new rules about the sale and proper use of tobacco, along with the changing social patterns in the adoption and cessation of smoking, show that the cultural acceptance and definition of tobacco is very much in flux. The norms operating at one point in time may weaken and change at another and this points to possible dangers in the future smoking prevalence levels for these East Asian countries. In China, there is little sign of any sizable cessation of smoking among men, though the absence of comparable nationally representative cross-sectional surveys limits any firm conclusions. The educational differences in prevalence in the 1996 survey may indicate some awareness by the more advantaged groups of the health dangers in smoking and increased cessation by them. A 2002 national prevalence survey reported by Yang et al. (2005) indicates small declines in the prevalence of male smoking between ages 20 and 55, in comparison with the 1996 results. For women, little change occurs until age 50, but declines above that age, in comparison with the earlier survey are apparent. On the other hand, smoking data from a large-scale cardio-vascular study (Gu et al. 2004) for 2000-2001, while confirming declines among men in the 35-64 age range, indicate some increase in prevalence among women in the 35-54 age range in comparison with the current smoking rates in the 1996 study.

In Japan and Korea some decline in prevalence among men from the very high rates of the 1970s and 1980s is evident, especially at older ages, but the fact that more than half the men were smoking as of 2003 indicates that a rather strong smoking culture among men persists (Table 3). Coupled with this is the danger that smoking among younger women, which has been very low over a very long, may increase in the future as the social position of women and societal attitudes about proper smoking behavior change. This has already occurred to some extent in Japan, as shown in table 3, where smoking among women 20 – 29 years of age has steadily advanced from 7% in 1965 to 24% in 2003.
In all three countries the social position of women has been changing markedly in recent years. Fewer women are marrying, and marriage is occurring later. In Korea for example, 40% of women were single at ages 25-29 in 2000 compared to 14% in 1980 (Byun 2004, table 6.3) and in China, the proportion never married increased from 5% in 1982 to 13% in 2005 (China Data Center). More women at these ages are joining the labor force and the roles they are adopting of modern educated businesswomen may lead to redefinition of their behavior in a number of areas, including smoking. In Japan, for example, the proportion of employed young women with junior college or university education has increased markedly between 1982 and 2002 (Matsukara et al.2008, figures 9c-d). Marugame et al. (2006) suggest that this expansion has created greater tolerance and social acceptability of women smoking and Fukuda et al. (2005) mention that growing concern about weight control and acceptance of smoking as fashionable as contributing causes of the observed increase in female smoking. (Waldron [1991] also identifies concern with weight as a factor promoting women's smoking in her analysis of gender differences in Western countries.)

Women will also be subject to more aggressive marketing as companies realize the size of the potential market and changing trade practices have opened up these countries to more competition. They well recognize the great sales potential if they can increase smoking rates among women. As stated more dramatically in Shafey (2009:32), “You could say the single biggest marketing opportunity in the world is to sell cigarettes to Chinese women” (quote attributed to Jeff Collin). In China, companies have introduced cigarettes that are marketed especially for women, "characterized by their long, slim and colorful designs" (Ho et al.2010:14).

Investigators in each country have conducted a number of surveys of adolescent smoking behaviors, attitudes and knowledge in order to gauge possible future trends and to identify needed actions. These are difficult to summarize as the methods, ages, and geographic areas covered vary, and a multiplicity of measures are often employed ranging from proportions who have experimented (have taken at least one puff), to those who have smoked in the last 30 days, to those currently smoking.

The 1998 study (Yang et al. 2004) was one of the largest, covering 24,000 youth in the 11 to 20 age range residing in 24 "disease surveillance points" and including youths who were no longer students. The key findings are that 48% of boys and 13% of girls have experimented with smoking (had ever taken a puff) while 9% of boys and less than 1% of girls were considered ever
smokers (had ever smoked weekly for three months). Urban girls were much more likely to have experimented or to be ever smokers than rural girls. Smoking increased with age, and 28% of the urban males ages 19 – 20 were classified as ever smokers but this gradient did not appear for females. (The Yang et al. study also reviews some key findings from earlier studies of adolescents)

Another major study of adolescent smoking behavior in China is the seven cities study of 2002 (Johnson et al. 2006) which showed higher levels of smoking among vocational high school students then academic high students. Its measure of "past-month" smoking (smoked one or more days over the past 30 days) placed 12% of academic high males in that category compared to 43% of vocational high males. For females, the comparable figures were 3% and 12%. A study by Ho et al. (2010) focused on rural and urban young women (14 to 24 years of age) and found that 20% of this group had ever smoked or experimented with cigarettes, but only 3% were classified as current smokers (smoked in the last 30 days). Urban students were about twice as likely to be current smokers as rural ones.

In addition to surveys specifically among adolescents, information about the age of initiation among smokers in their 20s provides some insights into the risks facing the young. In the 1996 national prevalence survey, the average age of initiation of male smokers aged 20-24 was 17.3 and for females, 18.4. Also, the prevalence of smoking increased sharply at the younger ages for males: while 17% of males age 15-19 smoked, 52% of those aged 20-24 did so, showing the sharp uptake at these young ages.

Osaki et al. (2006) present for Japan smoking prevalence by sex and school grade from surveys conducted in 1996 and 2000. The 2000 survey reveals that for males, ever-smoking (tried at least once) increased from 23% to 56% between 7th and 12th grade, while current smoking (smoked at least once in the last 30 days) increase from 6% to 37% over the same span. For females, the advance in ever-smoking percentages was from 16% to 37% between 7th and 12th grades, while the current smoking measure increased from 4% to 16% from the start of junior high to the last year of senior high. The survey also revealed that among 12th graders, 19% of males and almost 6% of females are considered daily smokers -- having smoked every day over the last 30. The most important source of tobacco for adolescents was vending machines, which are quite ubiquitous in Japan and have been identified by a number of observers as a prime factor in adolescent smoking.
According to the South Korea Global Youth Tobacco Survey conducted in 2004 reported by Rudatsikira et al. (2009), 7% of males and 5% of females between the ages of 11 and 17 were classified as current smokers (having smoked at least once in the last 30 days), but little additional detail on prevalence by gender is given.

It is difficult to make firm comparisons of prevalence levels of adolescent smoking across countries, as definitions, sampling plans, and coverage tend to vary and even surveys within a country can show wide variation on seemingly similar measures. With that caveat, it would seem from a comparison of the China seven cities study with the 2000 survey in Japan, that the prevalence of ever smoking (having tried at least once) is somewhat higher in China than Japan at both the middle/junior and senior high school levels for males, but similar among females. For current smoking prevalence (at least once in the last 30 days) Chinese males may be higher at the middle school level, but Japanese females show a higher prevalence among those in senior high. Both China and Japan appear to have higher prevalence among adolescents then South Korea, and in these two countries the level of current smoking among both male and female senior high students is substantial for these young ages. And those studying this younger population are quite uniform in calling for more restrictions on adolescent access to cigarettes and for increased and diversified health education steps within the schools.

Each of the three countries is a signatory to the 2003 WHO Framework Convention on Tobacco Control, which commits them to a number of anti-tobacco actions, but each had some programs in place before that date. As in other spheres, the comprehensiveness and effectiveness of these programs appear to have very across the countries. At a general level, analyst of tobacco control programs and policies appear to give higher marks to the steps taken by Korea than those undertaken in China or Japan.

For Korea, Khang et al. (2009) identify 1995 as a watershed year for anti-smoking policy, with the enactment of the Health Promotion Act. Before that date, they consider relevant policy to be meager, though as noted elsewhere general warning labels on cigarette packages were introduced in 1976, and advertising was banned in 1988. The 1995 act restricted smoking in public buildings and places and banned cigarette sales to juveniles. In 1998 a National Health Promotion Fund was established, using tax revenues from cigarettes, which promoted anti-smoking campaigns featuring television stars. In 2002, major television channels stopped showing smoking scenes, and the labeling of packages with tar and nicotine content was
mandated. Also in that year, the KT&G government tobacco monopoly was privatized. After signing the WHO framework, Korea took the significant step of increasing the tax per cigarette package by 29%. Many observers have found that increasing taxes on tobacco is one of the most effective steps in reducing prevalence, and two studies of Korea's experience bears this out (Levy et al. 2010, and Kim and Seldon 2004). The Levy et al. (2010) study also found the media campaigns to have played a role in reducing prevalence. In addition to increased taxes, Korea in 2006 set up a national quit line service, and began providing smoking cessation assistance at 250 health centers.

Socio-economic differentials in smoking prevalence in Korea are quite marked and have increased between 1995 and 2006, as men with more education and higher income has decreased their level of smoking more than those with lower socioeconomic status (Khang and Cho 2006.). As a result the government in 2005 set national targets for reducing the socio-economic differentials, but few programs specifically designed to address this problem have as yet been developed or initiated.

China's anti-smoking policies and programs are more limited than Korea's, and considered behind those of most countries. In particular, it has not chosen to increase taxes on cigarettes sufficiently to act as a deterrent or to use the funds generated to develop effective programs that would prevent people from initiating smoking and help smokers quit (Malone 2010). China has taken a number of anti-smoking actions, including banning advertising in many mass media (but not magazines or billboards), prohibiting smoking in many public places, in schools and childcare centers, and in public transportation carriers and waiting rooms, but implementation and enforcement varies considerable among cities and local areas, and workplaces are not generally smoke-free. In preparation for the 2008 Olympics, China did institute strong smoke-free policies for Beijing and several other areas, and this may signal a more aggressive set of anti-smoking programs. In 2007, for example, it started a program to train tobacco control specialists at public health schools at seven universities (T. Yang et al. 2009).

Japan's anti-smoking policies can be traced to 1900. In that year it passed the Juvenile Smoking Prohibition Law in reaction to the rapid growth of smoking by young people, though no efforts to curb adult smoking by men and women were taken (Sato 1999). Sato traces the official policies taken by Japan over the last 50 years. These consist mainly of warning labels and tar and nicotine content on cigarette packages, some bans on smoking in streets and public transportation
(but allowed in restaurants and designated public areas) and non-smoking education programs in schools. A number of large and small companies have limited smoking on their premises. In general, smoking in Japan has been regarded as a matter of personal responsibility and as an issue of good manners and consideration, illustrated by the admonition to "have a good smoking etiquette" on cigarette packages (Sato 1999:587) and similar campaigns.

To date, Japan has not used the economic incentive of raising taxes which a number of observers believe is needed, particularly to curb smoking by youth and the lowest socioeconomic groups who are sensitive to costs (Fukuda et al. 2005; McCurry 2009). They also point to the need to eliminate or control the 500,000 vending machines, improve health education programs within the schools, and enhance access to smoking cessation services (Fukuda et al. 2005).

But beyond the information and education campaigns, rules and regulations, and economic incentives to curtail smoking, there is the need to address what has been the subtext of this analysis – the norms, attitudes, and values that guide proper behavior. In this regard China, Japan, and Korea face two different challenges: to alter the existing norms that promote the high smoking rates among men; and to promote values and attitudes that prevent an upsurge in female smoking, insofar as the current norms inhibiting this behavior are weakening in the face of rapid social change.

Norm change strategies to promote the cessation of smoking are part of the California Tobacco Control Program as described by Zhang et al. 2010 and the importance of considering norms as part of the anti-smoking campaign in East Asia has been noted by several observers (Khang, et al. 2009; Cho et al. 2008; Marugame et al. 2006). Some interesting efforts along these lines appear under way. In China, Malone (2010) notes a video3 produced by the Chinese Center for Disease Control and Prevention which tackles the widespread social custom of proffering cigarettes to others or offering cigarettes as gifts by showing in graphic terms that “giving cigarettes is giving harm”. Whether programs like this one will be successful in reducing the prevalence of smoking among men and preventing initiation by young woman remains to be seen, but it does mark an important effort to alter the social climate for smoking in a more healthful direction and to use the power of norms as another tool in tobacco control efforts.

3 The video may be viewed at http://www.worldlungfoundation.org/ht/d/sp/i/7217/pid/7217.
REFERENCES


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