A cohort analysis about the effect of educational attainment on smoking behaviors in China

As smoking is widely regarded as a huge threat to human health in recent decades, some researches have examined the effect of formal education on individuals' smoking behaviors, and the results show that more years of formal education are significantly related to lower possibility of smoking and less tobacco consumption. (De Walque, 2004; Giskes et al., 2005; Zhu, Giovino, Mowery, & Eriksen, 1996) However, such correlation hasn't been examined sufficiently from an international perspective, and researchers haven't paid enough attention to the causal mechanism through which education influences smoking behaviors. China has the largest population of smokers in the world today. There are almost 300 million smokers in China, along with more than 540 million second-hand smokers. Therefore, it is an urgent request from policymakers now to discover the potential factors and pathways that could reduce smoking.

Although it has been well established by many researchers, the relationship between educational attainments and smoking behaviors is not always linear. People's attitudes and knowledge about tobacco use are largely influenced by the popularity and accessibility of correct information about the harm of smoking. Therefore, for different age cohorts, the effect of education on tobacco use might be different, even opposite. Since anti-smoking policies and movements spread over the country only in recent years, for elders, the effect of education should be weaker due to the lack of information when they were young.

Previous literatures have commonly assumed and discussed three different causal mechanisms through which education may influence human health. The first is the "information-transfer" argument, which believes that formal education enriches people's basic knowledge about the harm, cause and prevention of certain disease. The second mechanism focuses on the improvement of people's attitudes, arguing that education increases their positive attitudes, which results in healthier behaviors and lifestyles. The third one concentrates on the enhancement of people's higher-order cognitive skills, such as reasoning, novel problem-solving, effortful thinking, and task planning, which help people transform basic facts into deeper knowledge that enhances risk assessment and decision-making skills. (Baker, Leon, & Collins, 2011) The three mechanisms provide a theoretical framework for this paper. By examining their effects separately, this paper tries to identify the most salient one that could be applied to explain the effect of education on smoking in China.

This paper plans to examine the correlation between educational attainment and smoking behaviors in China, and tries to discover how formal education could contribute to the prevention of smoking. To be specific, three research questions are addressed. (1) What is the effect of educational attainment on individuals' smoking behaviors in China? (2) How does such effect vary in different age cohorts? And (3) what is the main causal mechanism through which education matters?

Data from The Global Adult Tobacco Survey (GATS) in China in 2010 will be analyzed in this study. GATS is a nationally representative household survey of adults 15 years of age or older and focuses on people's knowledge, attitudes and perceptions about smoking. 13,354 households in China participated in the survey.

This paper first uses Multiple Linear Regression (MLR) to estimate the effect of educational attainment and other influential factors on individuals' smoking behaviors. Second, I apply cohort-analysis to examine how such effect change among three age groups: young group (aged

17-40), middle group (aged 41-60), and old group (aged 61 and above). Third, structural equation modeling (SEM) technique is employed to measure the mediating effects of knowledge about smoking and attitudes toward smoking, which imply two possible causal mechanisms. People's knowledge and attitudes are latent variables constructed from a series of survey questions separately.

The preliminary results show that educational attainment has a significantly negative effect on smoking behaviors in adults in China, which is consistent with the findings in other countries. As control variables, individual's age, gender, region (east, central or west), and residential area (urban or rural) are all strong predictors. In brief, men are much more likely to smoke than women, and people who live in rural place and west part of China have higher possibilities to smoke. However, the effect of family wealth is not notable. Considering that cigarette is much cheaper in China than in most developed countries, the finding confirms that there is no economic barrier for people to keep their smoking habits.

Cohort analysis reveals a strong age difference among the effect of education on smoking behaviors. Such effect is significantly negative in young group, but disappears in old group. For young group, more educated people postponed their smoking ages, and stand against smoking behaviors and smoking environment more than less educated ones. But for old group education doesn't have such influence on people's behaviors or attitudes.

Education influences people's smoking behaviors through increasing their knowledge about smoking and enhancing their anti-smoking attitudes together, but slight difference among age cohorts are found. The mechanism of increasing knowledge works better for elders, and young people's tobacco use is more affected by their anti-smoking attitudes.

Overall, the findings show that people with more formal education are more likely to avoid smoking and live in smoking-free environments. Therefore, promoting mass education continuously in China could be an effective way to accelerate anti-smoking movements.

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