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Does more education lead to better health habits? Evidence from the school reforms in Australia

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ABSTRACT

The current study provides new empirical evidence on the causal effect of education on health-related behaviors by exploiting historical changes in the compulsory schooling laws in Australia. Since World War II, Australian states increased the minimum school leaving age from 14 to 15 in different years. Using differences in the laws regarding minimum school leaving age across different cohorts and across different states as a source of exogenous variation in education, we show that more education improves people's diets and their tendency to engage in more regular exercise and drinking moderately, but not necessarily their tendency to avoid smoking and to engage in more preventive health checks. The improvements in health behaviors are also reflected in the estimated positive effect of education on some health outcomes. Our results are robust to alternative measures of education and different estimation methods.

1. Introduction

There is numerous evidence that unhealthy behaviors substantially account for people's poor health outcomes. It is estimated that approximately half of the deaths that occurred in 1990 in the USA were caused by unhealthy behaviors such as smoking, poor diet, insufficient exercise, excessive drinking, and illicit use of drugs (McGinnis and Foege, 1993). Although smoking remains one of the leading causes of mortality, poor diet and physical inactivity may soon overtake tobacco as the leading causes of death (Mokdad et al., 2004). Unhealthy behaviors have also often been cited as the main predictors of chronic diseases such as cancer and heart disease (Doll and Hill, 1956; Wilson, 1994; Boffetta et al., 2006). This raises an important, policy-related question: What can we do to improve people's health-related behaviors to, in turn, improve their health outcomes?

One answer to this question is simply to increase people's education level. Economists have provided a theoretical framework in which education plays an important role in the health production process. According to the demand-for-health model (Grossman, 1972, 1975, 2000), higher levels of schooling have a direct effect on health and health behaviors. Better education leads to more efficient use of a given set of health inputs by improving decision-making abilities (productive efficiency) and improving the "allocative efficiency" among various health inputs by increasing a person's ability to acquire and process health information. All other things being equal, this higher production efficiency generated by education raises future returns (in terms of both future health and lifetime earnings) to health investments, and therefore better-educated individuals are more likely than less educated individuals to choose healthier lifestyles.

Education may also have a positive impact on people's health behaviors indirectly. The most discussed effect of education on health is through its effect in the labor market. For example, studies have shown that better-educated people tend to enjoy better employment outcomes and higher wages (Card, 1999). This may in turn improve health habits by increasing the affordability of other health-improving inputs that are complementary to health habits (e.g., better access to healthier foods and gym membership), or by increasing access to healthcare (via increased income or employment-based health insurance), or by reducing income volatility and income-related stress which are factors that tend to discourage people from engaging in healthier lifestyles (Contoyannis and Jones, 2004). Another theory is that education could lower individuals' discount rates and make them more patient and future-oriented (Becker and Mulligan, 1997), which in turn leads to better health behaviors. Better-educated people may also have healthier peers who encourage better health behaviors

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(Garivia and Raphael, 2001; Duncan et al., 2005). They also tend to be more optimistic, have better coping styles, enjoy higher levels of social support, and have the values and dispositions necessary for achievement, all of which may contribute positively to their health behaviors and health outcomes (Penny and Robinson, 1986; Ross and Wu, 1995; Taylor et al., 2000).

Empirical studies on this subject have found striking correlations between education and health behaviors that are consistent with the theories. For example, researchers have found better-educated people to smoke less, consume less alcohol, exercise more, eat healthier food, and have more frequent health checks (Droomers et al., 1999; Cutler and Glaeser, 2005; Cutler and Lleras-Muney, 2010). However, because their causal implications are difficult to interpret, cross-section patterns are only suggestive. For example, causality may also run in reverse from health behaviors to more schooling; i.e., students with healthier lifestyles may also be more efficient producers of additional human capital, thus implying that estimates of the education effect on health behaviors will be biased upward. There may also be important omitted variables from the estimation model, such as rates of time preferences (Fuch, 1982) and heritable endowments (Behrman and Rosenzweig, 2004), which may influence both education and health behaviors simultaneously. One could imagine that people who are born with predispositions that make them more future-oriented (i.e., those who desire more leisure at an older age) will remain in school for longer, work more at a younger age, and invest more in positive health behaviors during most stages of their lifecycle. Thus, the effect of education will be biased upward if we fail to control for time preferences. Another important bias is the measurement error bias associated with the manner in which education is typically measured in surveys, which may bias the estimated education coefficient towards zero (Blackburn and Neumark, 1995).

Recent studies that have attempted to estimate the causal effect of education on health behaviors have mainly dealt with the endogeneity issue by relying on quasi-experiments such as changes in the compulsory schooling laws or an idiosyncrasy of geography or birthdate to generate an exogenous variation in people's schooling levels (Eide and Showalter, 2011), and the findings have been mixed. Many studies have found positive effects of education on various measures of health-related behaviors or variables that are related to behaviors, such as body mass index (BMI). Using the state of residence in childhood as instruments for schooling, Sander (1995) found that a higher level of schooling significantly reduced the probability of smoking among adults in the 1986–1991 US General Social Survey. Arendt (2005) obtained a similar set of findings when he used two compulsory schooling reforms in Denmark to address endogeneity of schooling in BMI and smoking regression equations. He showed that the estimated effects of schooling on BMI and smoking are larger than the coefficients obtained by ordinary least-squares (OLS) when endogeneity was corrected for. Park and Kang (2008) showed, using high-school availability and birth order of Korean men as instruments, that more education induced individuals to exercise more regularly and to get regular check-ups, but had little effect on smoking and drinking. Using changes in compulsory schooling in Sweden as instruments, Spasojevic (2010) reported a positive schooling effect on BMI in the healthy range, although the effect was significant only when one-tailed tests were used. Jürges et al. (2011) used education expansion in western Germany as instruments and found that more education significantly reduced the probability of being a smoker for both men and women.

By contrast, other studies have found education to have virtually zero effect on health-related behaviors. Using changes in compulsory schooling laws in Germany between 1949 and 1969 as instruments, Kemptner et al. (2011) showed that more education did not statistically significantly reduce the probability of smoking for both men and women. Using February birthdates as an instrument for obtaining a high-school qualification in the UK, Braakmann (2011) found a statistically insignificant effect of education on smoking, drinking, and eating certain types of food. In one of the most comprehensive studies on the causal effect of education on health and health-related behaviors, Clark and Royer (2013) exploited two changes in the compulsory schooling laws in the UK to show that the reforms had no significant impact on smoking, eating healthily, and exercise. More examples of nonsignificant effects of education on health-related behaviors can be found in Arendt (2005) and Kenkel et al. (2006) with respect to current smoking behaviors and the probability of having never started smoking in the first place.

One explanation for the mixed findings might be due to the different measures of health-related behaviors, quasi-experiments, statistical methods, sub-samples, and data sets used across these different studies. Thus, in order to advance our understanding of the causal effect of education on health-related behaviors, more evidence is required from contexts that have not as yet been explored in the literature. New research must also follow as closely as possible the statistical methods used by previous studies. It should also examine as many health-related behaviors as possible in a single study. The current study does this by being the first of its kind to exploit one of the most commonly used sources of exogenous variation in education in the literature, i.e. changes in the compulsory schooling laws that occurred in different years and across different states, to study the causal effect of education across ranges of health-related behaviors in Australia.

Our paper, which is the first of its kind for Australia, adds to the existing literature on the causal links between education and health by studying a different institutional environment to those previously examined in the literature; examples include studies that used changes in the compulsory schooling laws in the USA (Adams, 2002; Lleras-Muney, 2005), UK (Oreopoulos, 2007; Clark and Royer, 2013), Germany (Jürges et al., 2011), Denmark (Arendt, 2005), Sweden (Spasojevic, 2010), and South Korea (Park and Kang, 2008). In addition, our rich data set allows us to investigate the causal effect of education on a much wider range of health-related behaviors than has typically been examined in one study.

The current study is organized as followed. Section 2 presents a brief account of the health statistics in Australia and the institutional background of the Australian schooling legislations. Section 3 describes the data and the empirical strategy. Results and discussions are presented in Section 4. Section 5 concludes.

2. Health statistics and institutional background

2.1. Health statistics in Australia

Australia faces the same growing health issues as many OECD countries. Like the USA and the UK, Australia's current leading cause of death is coronary heart disease, with over 20,000 deaths in 2012 (ABS, 2014). This includes angina, blocked arteries, and heart attacks. The rate of obesity is also on the rise in Australia, with 10.8 million adults (63% of the Australian population) either overweight or obese in 2011–2012. Of these, 4.7 million were obese (NHPA Report, 2013). Given the ample evidence in epidemiology and the medical literature that individuals can significantly reduce the risk of developing a heart disease simply by abstaining from smoking, eating healthily, and exercising regularly, it is important that health policymakers in Australia know whether education has a causal effect on later health habits.

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