Today's Decisions, Tomorrow's Outcomes:
Do Risk Aversion and Impulse Control Explain the Health Gradient?

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Educational attainment is associated with a number of desirable outcomes, perhaps most importantly in terms of health and longevity, but the causes of this empirical fact are difficult to ascertain. The relationship between education and health is partly explained by indirect mechanisms such as income and wealth, but a significant component is irreducible to economic factors (Geyer, Hemström, Peter et al. 2006; Smith 2004). This suggests that education itself may confer health benefits, including health-related knowledge, an ability to process information, healthy lifestyles and behaviors, access to insurance and quality healthcare, and advantageous psychosocial resources (e.g., marriage) (Mirowsky and Ross 2003).

Another possible explanation for this phenomenon that is occasionally acknowledged but lacks much empirical support: there may be underlying factors other than childhood health that are associated with both educational attainment and adult health. In other words, people who attain high levels of education may have personalities, preferences, habits, outlooks, and attitudes that develop early in the life course, are necessary to succeed academically, and favor good health. This study will empirically test whether two specific characteristics, risk aversion and impulse control, at least partially explain the educational health gradient.

Only a small proportion of the vast literature on the relationship between education and health focuses on potential confounding mechanisms, with mixed results. Cutler and Lleras-Muney (2010) find that time discounting and risk aversion are not likely to explain educational differences in health behaviors, but Palloni and Thomas (2014) find that high school rank (which they use as a proxy for conscientiousness) and IQ are primary mechanisms. Gottfredson (2004) also argues that IQ is a major determinant of the health gradient, but Link and Phelan (2008) refute this claim and demonstrate that education is more predictive of health outcomes than is IQ. This handful of contradictory examples, a fraction of related research, is representative of the general disagreement concerning potential spuriousness and the role of various mechanisms in explaining the relationship between education and health. Despite this general disagreement, or because of it, it is essential to study the role of early-life characteristics in determining future

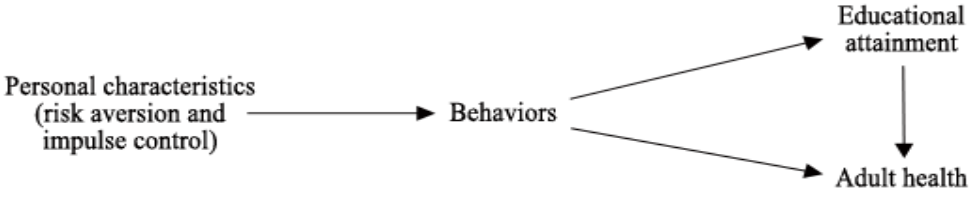
educational and health outcomes since both are indelibly influenced by factors that occur in conjunction with individual growth and maturation.

Educational attainment has many benefits, but these benefits may not be a result of education itself. Policies that encourage educational attainment could be redirected if underlying, early-life characteristics are responsible for associated beneficial outcomes. The two characteristics that are the focus of this study, risk aversion and impulse control, were chosen for several reasons. First, and most importantly, they are relevant to both educational attainment and health status: educational success requires a degree of self-discipline and personal control that is also important in minimizing disease exposure in modern epidemiological settings (Palloni and Thomas 2014). Figure 1 depicts the hypothesized relationship between these factors.

Second, risk aversion and impulse control are well developed concepts that have been used to describe a variety of behaviors. Gottfredson and Hirschi (1990) identify low self-control as a major determinant of deviant behavior, and many behaviors associated with low educational attainment and poor health outcomes are considered deviant. They argue that "many noncriminal acts analogous to crime (such as accidents, smoking, and alcohol use) are also manifestations of low self-control" (Gottfredson and Hirschi 1990:91), a claim that has not been adequately tested in the context of health and education.

Finally, the dataset being used has a number of questions that can provide a detailed portrait of risk averse and impulse control characteristics. These measures are described in more detail below.

Figure 1: The causal relationship between early-life personal characteristics, educational attainment, and health



DATA AND METHOD

Data from the National Longitudinal Study of Adolescent Health (Add Health) will be used to determine the extent to which risk aversion/impulse control explain the relationship between education and health (Harris et al. 2009). Add Health is a nationally representative survey with 20,745 adolescents in grades 7-12 in 1994-95 (Wave I). Wave IV was conducted in 2008, when most respondents were between the ages of 24 and 32. These two waves allow for risk aversion and impulse control to be measured prior to the completion of education, and most respondents will have completed their education by Wave IV.

Since respondents are too young at Wave IV for major health differences to develop, health behaviors will be used as proxies for later health outcomes. In particular, smoking is generally adopted in adolescence or young adulthood and has direct health effects later in life. Smoking is also associated with educational attainment (de Walque 2007, Link and Phelan 2009) and various personal characteristics (Clarke, MacPherson and Holmes 1982, Jusot and Khlat 2013, Khwaja, Silverman and Sloan 2007, Scharff and Viscusi 2011). The specific question being addressed with this model is whether educational attainment significantly predicts smoking when accounting for baseline risk aversion (e.g., seatbelt use, drinking and driving) and impulse control (e.g., stopping sexual intercourse to use birth control).

This study has a major advantage over previous research: baseline characteristics and behaviors are measured prior to the completion of education, and respondents are followed long enough for education and health differentials to begin developing. This elucidates temporal ordering in a way that is not possible with prospective and retrospective surveys conducted later in adulthood. Add Health also has many questions regarding early childhood that are asked of both the primary respondents and a parent or guardian (typically the mother), which allows for many childhood conditions to be controlled. With this detailed information, I can analyze key variables and important, often-missing controls in an attempt to determine whether education influences health, or whether early-life characteristics confound the relationship.

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