

Are Immigrants Positively Selected on Genetic Predisposition to Better Health?

Evidence for Height, BMI and Smoking from the Health and Retirement Study

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Background

- “Immigrant Health Paradox” – foreign-born have lower mortality and better health than the native-born despite their disadvantaged socioeconomic status (e.g., Markides & Coreil, 1986; Cunningham et al., 2008; Elo, Mehta, & Huang, 2011; Huang et al., 2011; Mehta et al., 2016; Reynolds, Chernenko, & Read, 2016; Riosmena et al., 2017; Singh & Hiatt, 2006).
- One possible explanation – “healthy immigrant effect” – healthier people are more likely to migrate. Immigrants are positively selected on health.
- We use genetic data, polygenic scores (PGS), to test this explanation.

Research Questions

- 1) Is there an immigrant health advantage with respect to genetic predisposition to certain health-related outcomes, specifically, height, BMI, and smoking?
- 2) Does the differences in genetic predisposition to height, BMI and smoking help explain the observed nativity differences in height, BMI and smoking, respectively?

Data and Method

Data: Health and Retirement Study (HRS), main data set and Polygenic Scores data Release 3, 2006-2012 Genetic Data (Ware, Schmitz, Gard and Faul 2018).

Sample: Non-Hispanic white adults age 50+ (N = 12,051). 423 or 3.5% foreign-born.

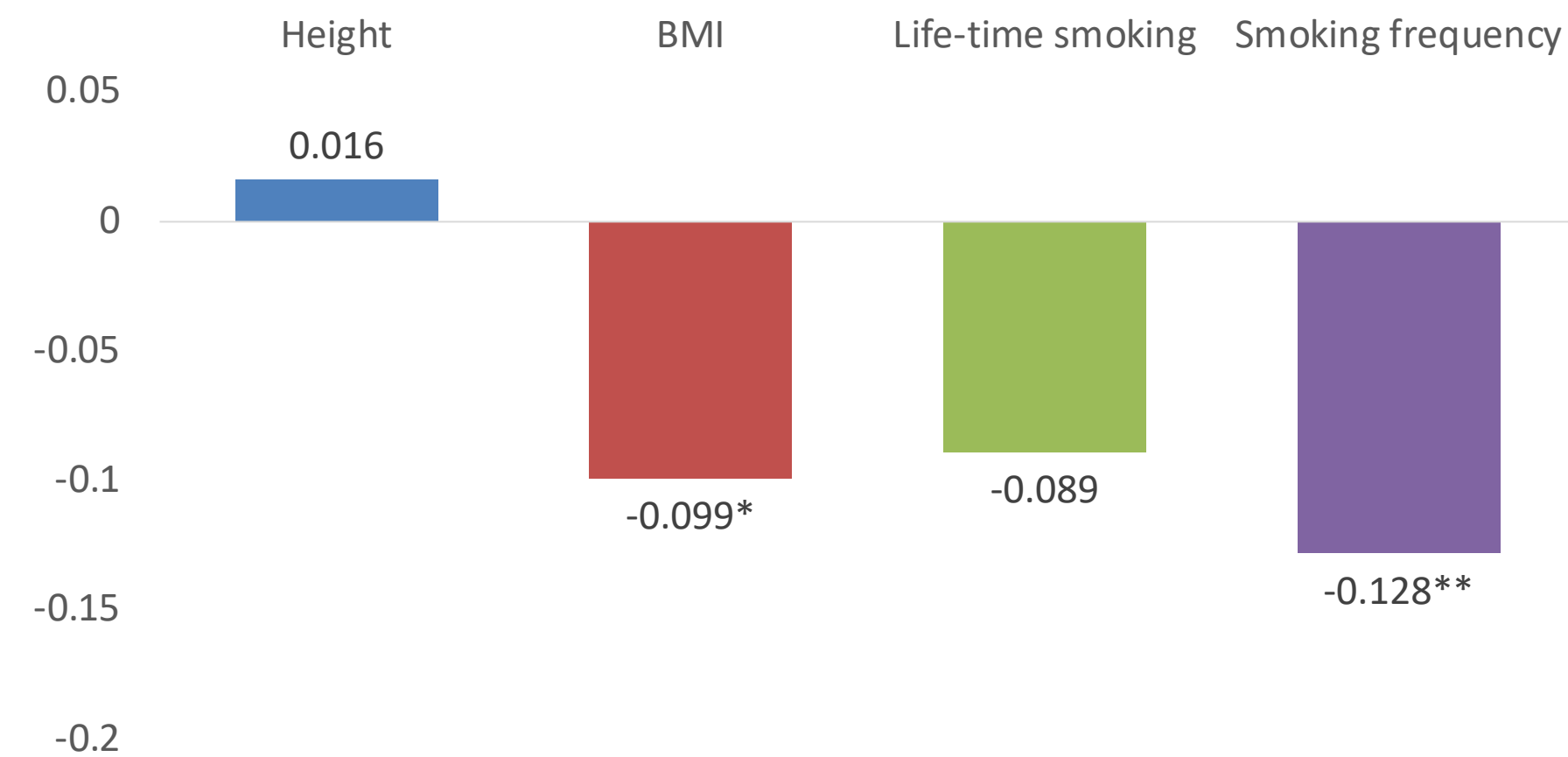
Method: OLS, logistic regression models.

Genetic measures: PGS for height, BMI, life-time smoking, and smoking frequency

Dependent variables: height, BMI, life-time and current smoking.

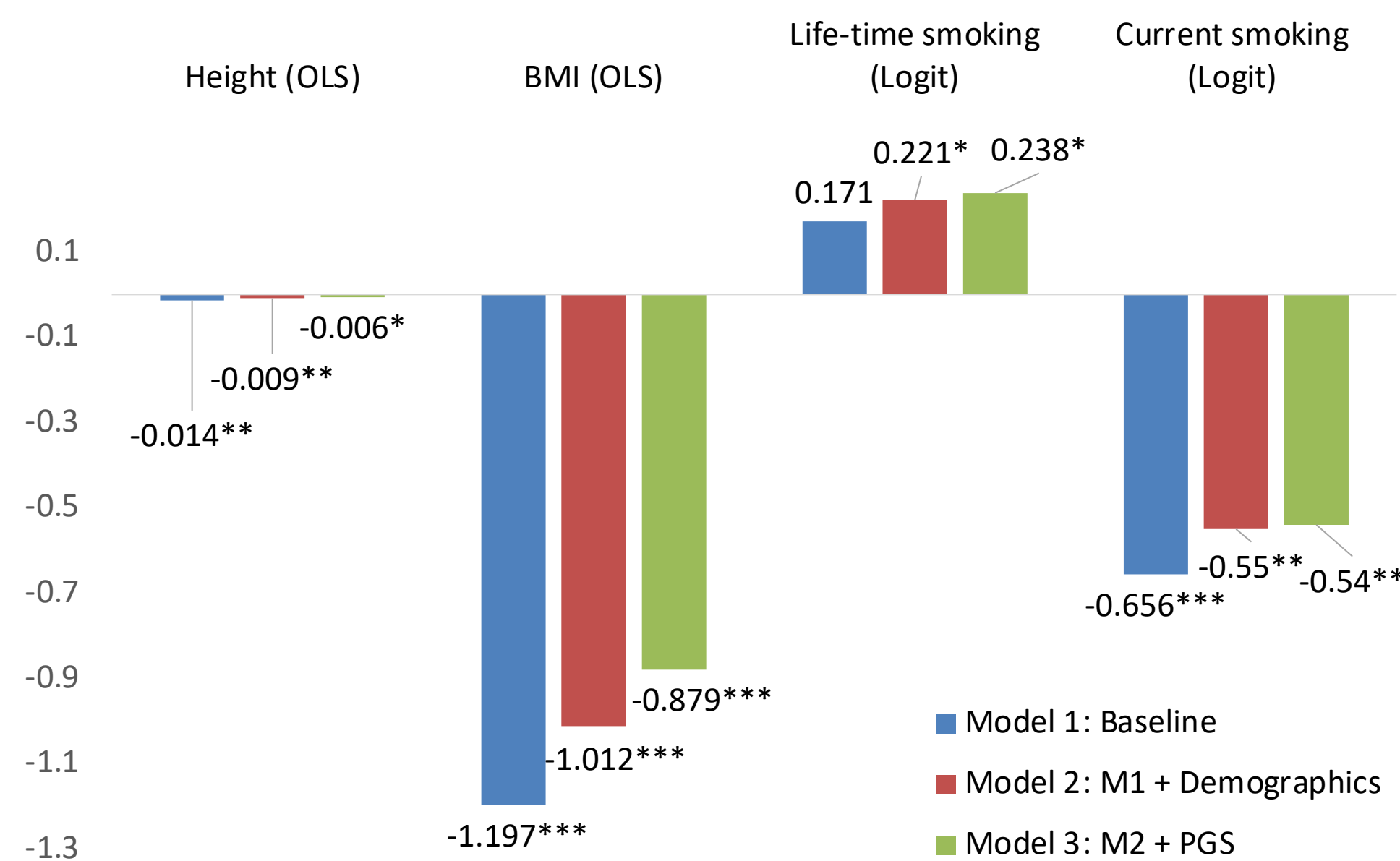
Controls: Age, sex, education, year of survey.

Figure 1. Foreign-born coef. from OLS regression models of PGSs



Unstandardized coefficients for foreign-born (ref. U.S.-born) from OLS models including 10 principle components
 *** p<0.001, ** p<0.01, * p<0.05.

Figure 2. Foreign-born coef. from OLS and Logit models of height, BMI and smoking



Unstandardized coefficients for foreign-born (ref. U.S.-born).
 *** p<0.001, ** p<0.01, * p<0.05.

Results

- Foreign-born have slightly favorable distribution of PGS for all 4 measures (Figure 1), although only the difference in the mean PGS for BMI and smoking frequency are statistically significant.
- Compared to U.S.-born, immigrants tend to be slightly shorter, have lower BMI and less likely to be current smokers (Figure 2).
- The differences are reduced after accounting for age, sex and education.
- Adding the respective PGS to the statical models further reduces the nativity differences in the observed characteristics.
- Interestingly, for life-time smoking, both demographic and genetic factors act as suppressors of an immigrant disadvantage.

Summary

- There is an immigrant health advantage in genetic predisposition to smoking frequency and lower BMI

Accounting for PGS:

- partially explain immigrant health advantage with respect to current smoking and BMI
- partially explains immigrant health disadvantage with respect to height
- reveals immigrant heath disadvantage with respect to smoking initiation

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Comments? Questions?
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