

Parental Education and Invention: The Finnish Enigma

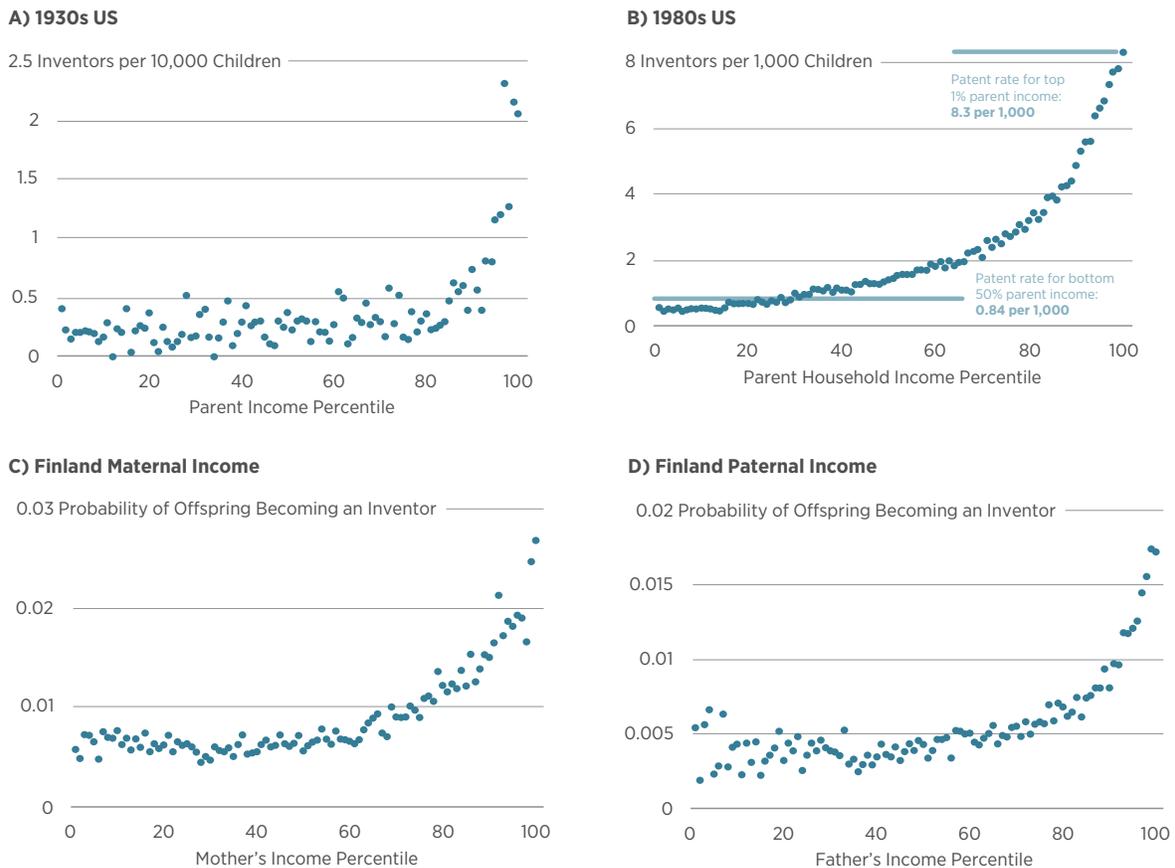
Based on BFI Working Paper 2023-26, “[Parental Education and Invention: The Finnish Enigma](#),” by Philippe Aghion, *College de France*; Ufuk Akcigit, *University of Chicago*; Ari Hyytinen, *Hanken School of Economics*; and Otto Toivanen, *Aalto University*

Education is key in determining whether offspring become inventors; the establishment of new universities allows higher-ability parents to study in a university, which enhances both the parents’ and their children’s human capital and skill formation, and increases offspring’s capacity to invent.

Key among the factors that influence whether a child grows to become an inventor are innate ability and social environment, including family resources and parental education. Parental income is a good predictor, with Figure 1 showing the relationship between the probability of offspring becoming an inventor and parental income, using recent and historical US and Finnish data.

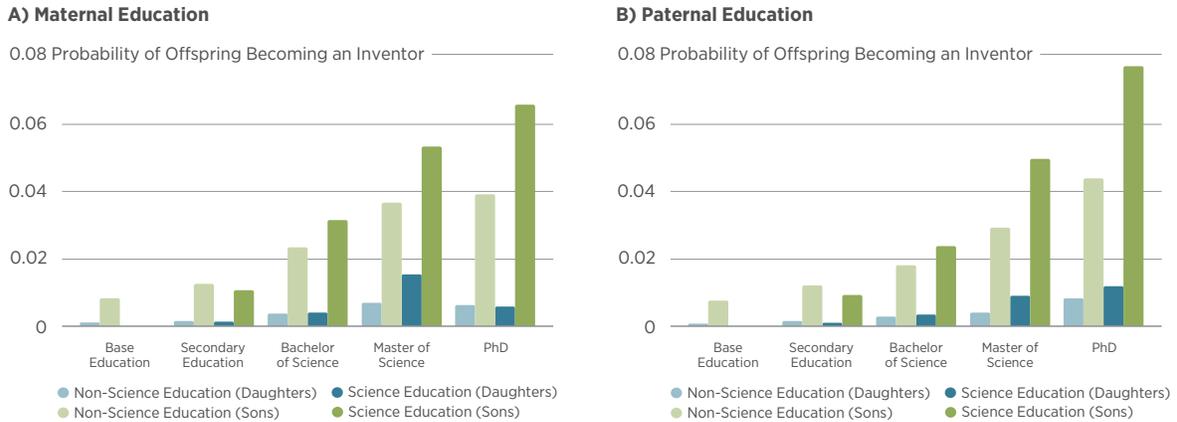
Why compare the United States and Finland? Because the two countries illustrate an enigma: Unlike the US, Finland displays low income inequality and high social mobility. Likewise, one would expect that income would play less of a role in Finland, with its more egalitarian society and equitable educational system.

Figure 1 • Relationship Between Parental Income and the Probability of Offspring Becoming an Inventor



Sources: Figure 1A: Akcigit et al. (2017), Figure 1B: Bell et al. (2019), Figures 1C & 1D: authors' calculations.

Figure 2 • Parental Education and the Probability of Offspring Becoming an Inventor



Note: Non-science and science refer to the field of education of the parent.

To address this Finnish puzzle, the authors examine the little-understood role of parental education on the probability of their offspring becoming inventors. Please see the working paper for details on the authors’ methodology but, broadly speaking, they merge four datasets that include individual data on 1.45 million Finns and their parents (including, for example, parents’ distances to the nearest university at age 19), and individual-level patenting data, along with other factors, to find the following:

- While parental income is positively associated with the probability of becoming an inventor, that effect is greatly diminished once parental education is controlled for. Given that parental education is unevenly distributed, this finding informs the Finnish enigma. Moreover, as shown in Figure 2, higher parental income is positively correlated with parental education.
- Parental university education has a large, positive local average treatment effect (LATE) on the probability of a child becoming an inventor. Also, while the causal impact of parental education on sons is higher than that on daughters, the impact relative to the baseline is larger for daughters.
- The average treatment effects on the treated (ATTs) are similar to LATEs, but those on the untreated are roughly one third lower. The ATTs suggest a significant impact of parental

education on the offspring, e.g., the probability of a son becoming an inventor increases by a factor of four compared to the sample average.

- Finally, Finland’s education reform implemented in the late 1960s, wherein the establishment of new universities improved parents’ ability to access higher education, has reduced the causal impact of parental education and income on the probability of inventing. In so doing, Finland both stimulated aggregate innovation and made growth more inclusive by allowing more talented individuals with low-educated parents to become innovators. Put another way, access to parental education has reduced the number of “lost Einsteins and Marie Curies” in Finland.

Bottom Line: Invention spurs growth, and a country that massively and persistently invests in education up to (STEM) PhD level can significantly increase its aggregate innovation potential, while also making innovation-led growth more inclusive. This work shows that while income matters in determining whether offspring become inventors, education is a great equalizer. Evidence from Finland, a country with low income inequality, reveals that the establishment of new universities allows higher-ability parents to study in a university, which enhances both the parents’ and their children’s human capital and skill formation in a way that increases the capacity of the offspring to invent.

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Arnold C. Harberger Professor in Economics,
Kenneth C. Griffin Department of Economics

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