Linking process to outcome

Inequality of educational opportunities and inequality of educational outcomes

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Two types of educational inequality

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  1. IEOpps (looking at the process) and IEOut (looking at the end result) are natural complements.
  2. Allows for a natural way to study the effect of educational expansion, and the disadvantaged position of other social groups on IEOut.

Outline

IEOpp and IEOut

Empricial applications
- The Netherlands
- USA

Conclusion

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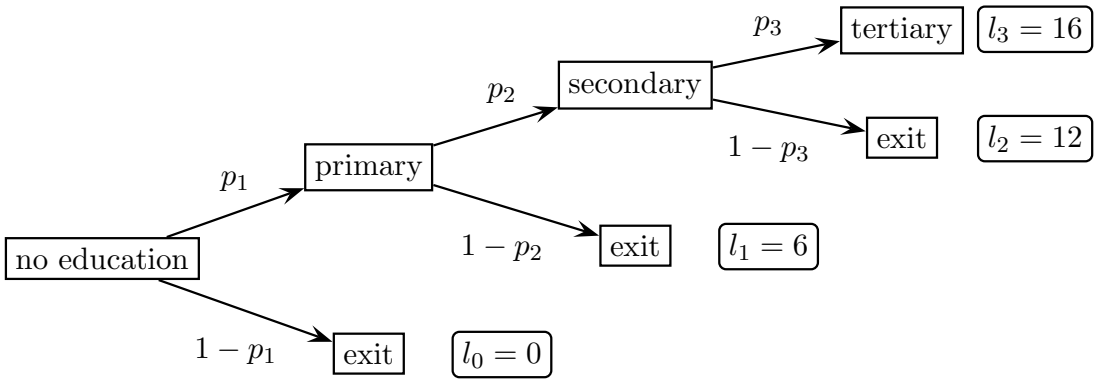
- This is a way of extracting more information from a sequential logit/Mare model.

Example

Figure: Hypothetical educational system



Modeling transition probabilities and the expected level of education

$$p_{ki} = \frac{\exp(\alpha_k + \lambda_k SES_i)}{1 + \exp(\alpha_k + \lambda_k SES_i)} \quad \text{if} \quad y_{k-1\,i} = 1$$

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$$E(ed) = (1 - p_{1i})l_0 + p_{1i}(1 - p_{2i})l_1 + p_{1i}p_{2i}(1 - p_{3i})l_2 + p_{1i}p_{2i}p_{3i}l_3$$

IEOpps and IEOut

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$$\frac{\partial E(ed)}{\partial SES} =$$
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IEOpps and IEOut

variance of the variable indicating whether one passes or not

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IEOpps and IEOut

expected increase in the level of education after passing

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IEOpps and IEOut

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IEOpps and IEOut

minus the expected level of education for those that fail

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- weights = at risk $\times$ variance $\times$ gain

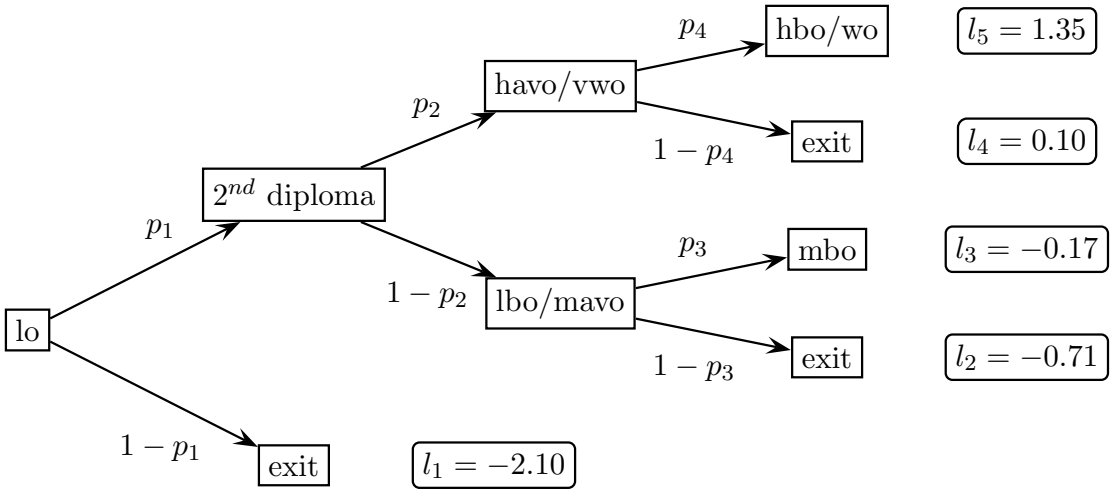
Outline

IEOpp and IEOut

Empricial applications
- The Netherlands
- USA

Conclusion

Simplified model of Dutch educational system



Data

- International Stratification and Mobility File (ISMF) on the Netherlands.
- 51 surveys held between 1958 and 2005 with information on cohorts 1894-1978.
- 67,000 respondents aged between 27 and 65 with complete information.

Variables

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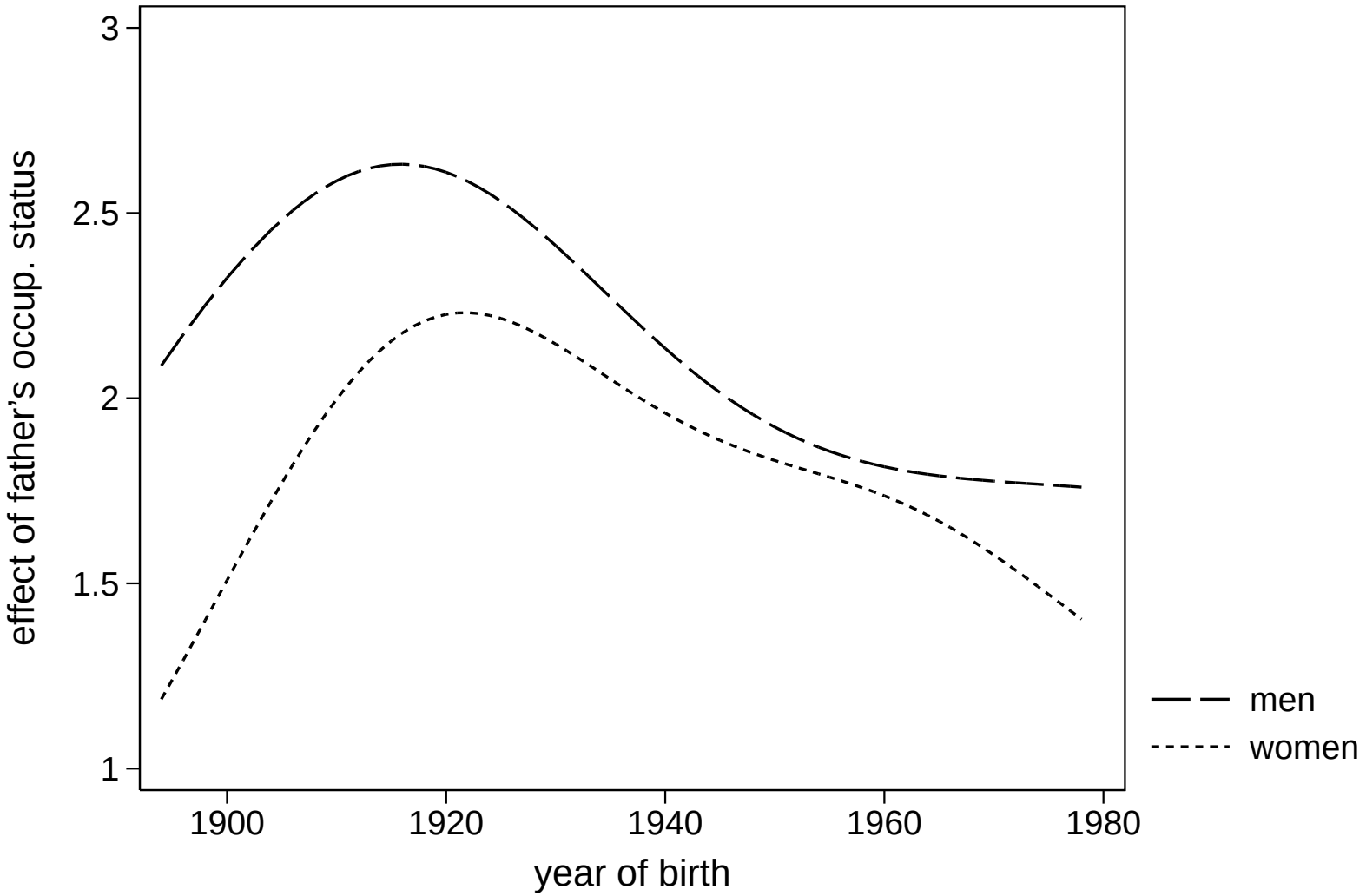
- Time measured as a restricted cubic spline with one knot in 1936.

Change in IEOut over cohorts



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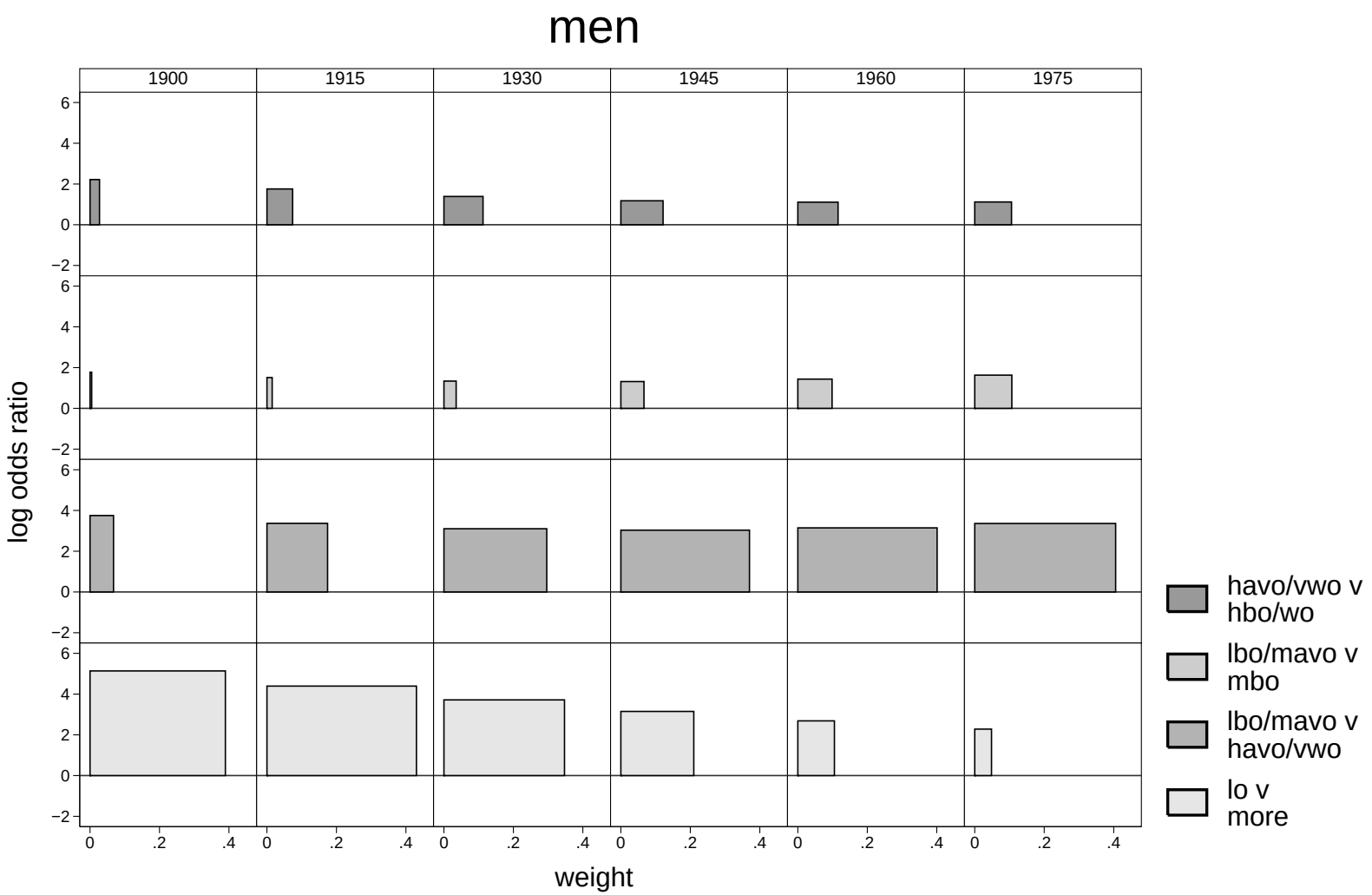
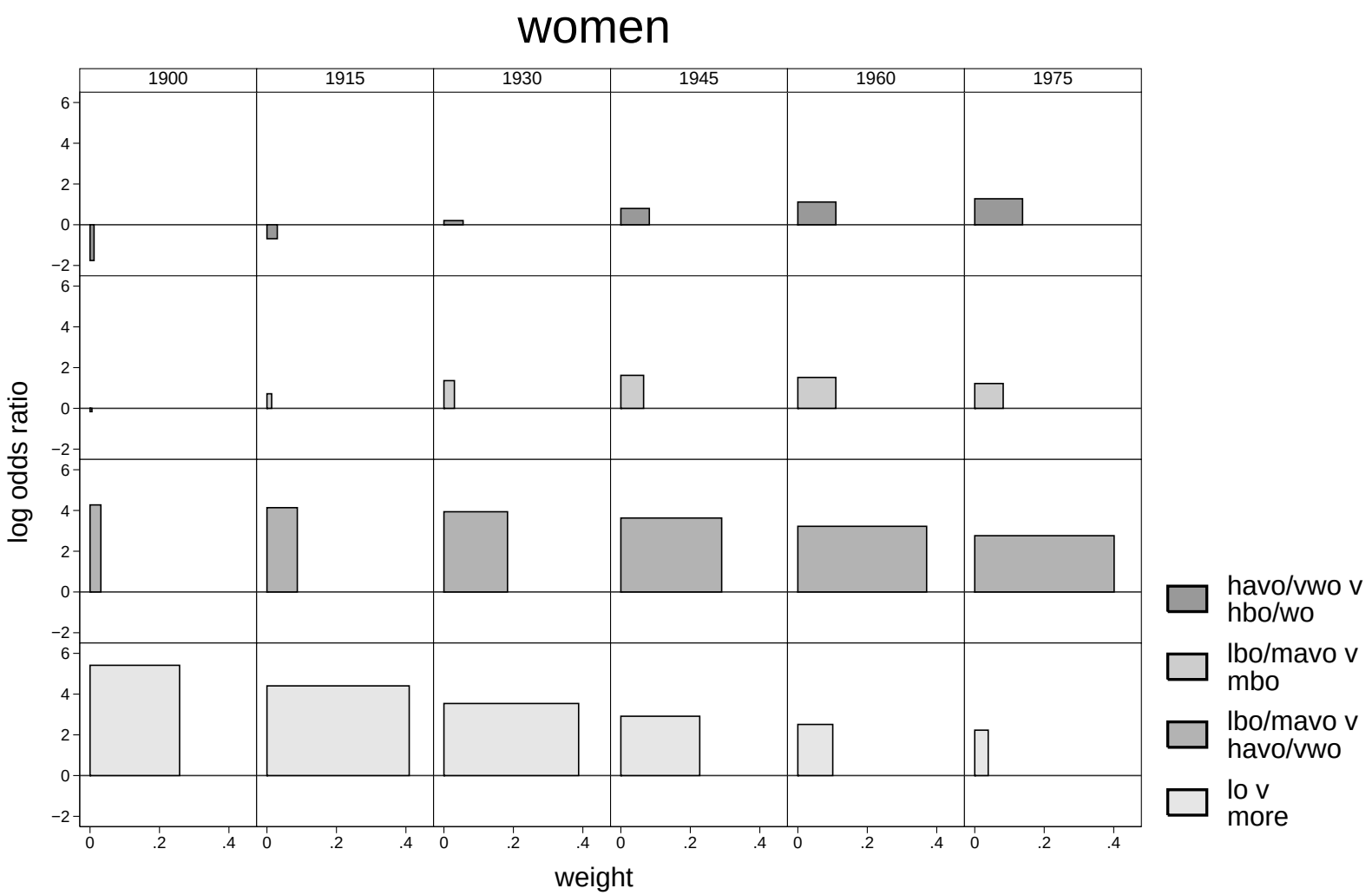
- This can be visualized as the area of a rectangle with width w_1 and height IEOpp_1.
- IEOut is the sum of the areas of these rectangles

Decomposition of IEOut for men



Decomposition of IEOut for women



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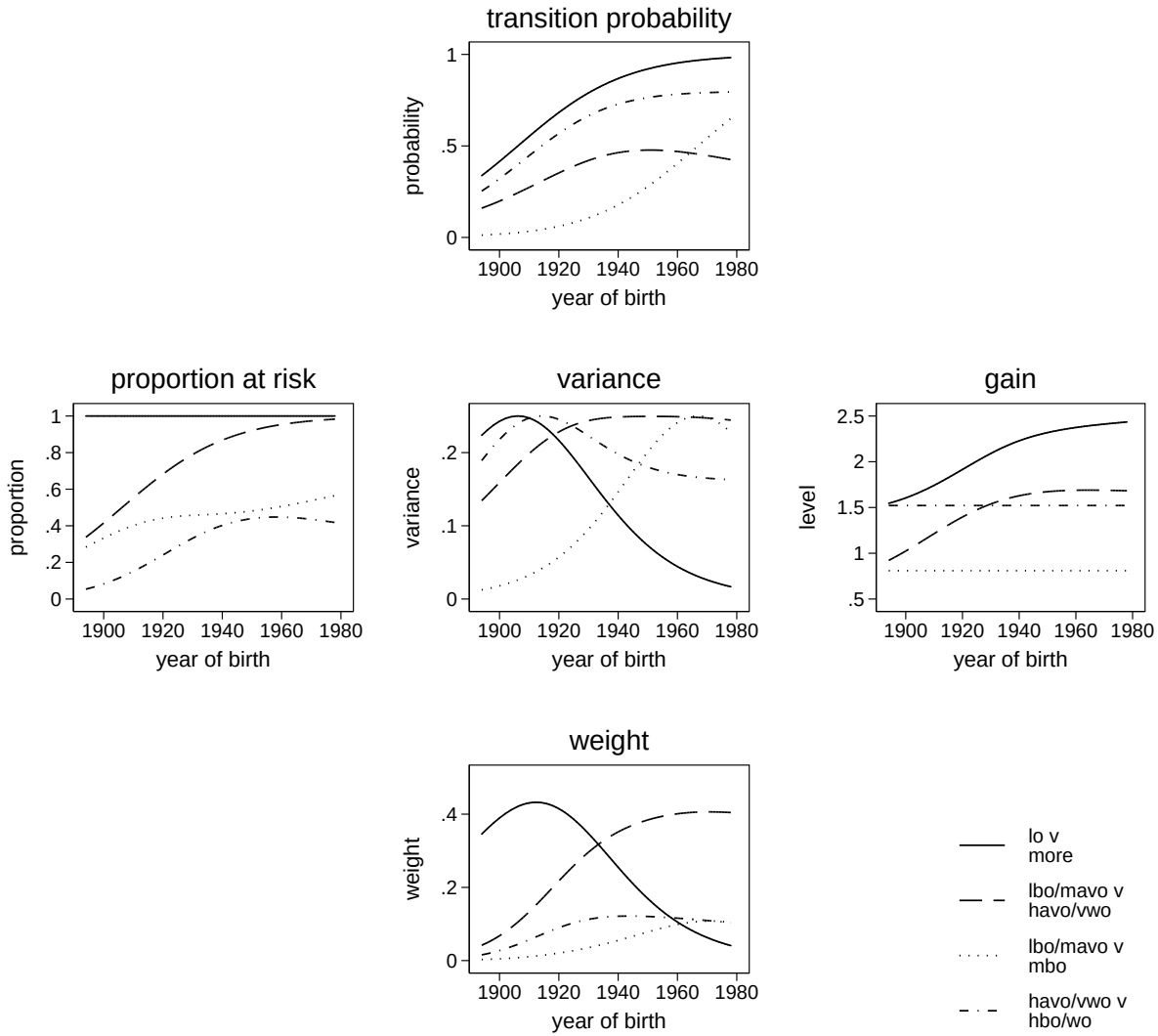
- These three elements are all a function of the proportions that pass the transitions

Decomposition of the weights for men



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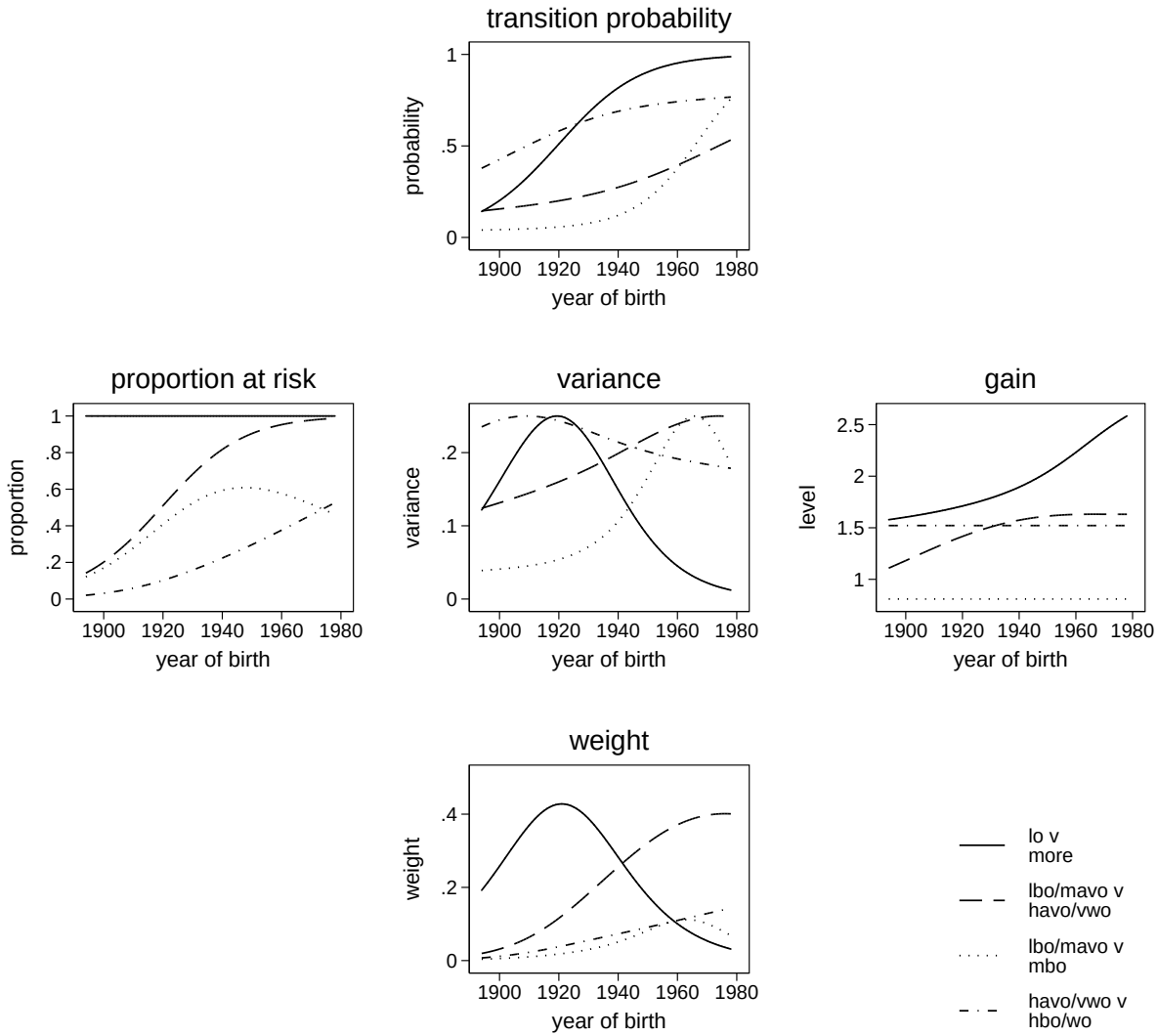

Data

- General Social Survey (GSS).
- 20 surveys held between 1977 and 2004 with information on cohorts 1913-1978.
- 13,400 men aged between 27 and 65 with complete information.

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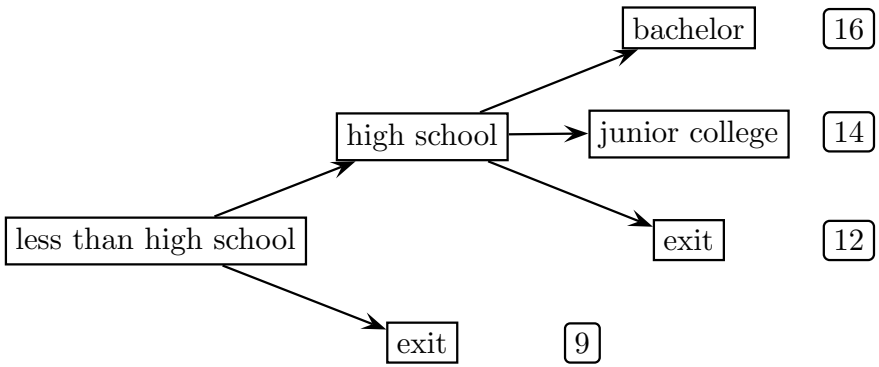
Simplified model of the US educational system



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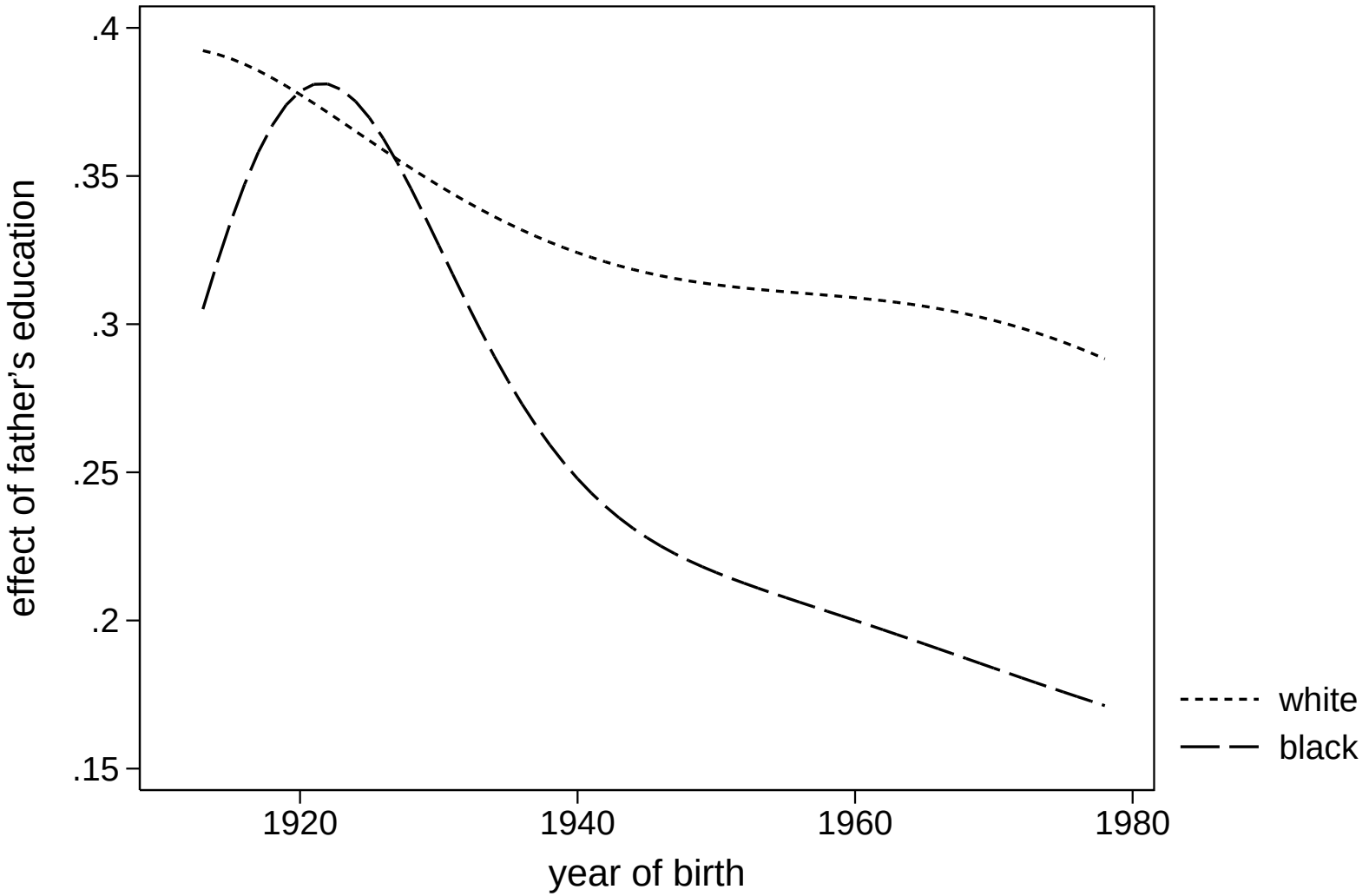
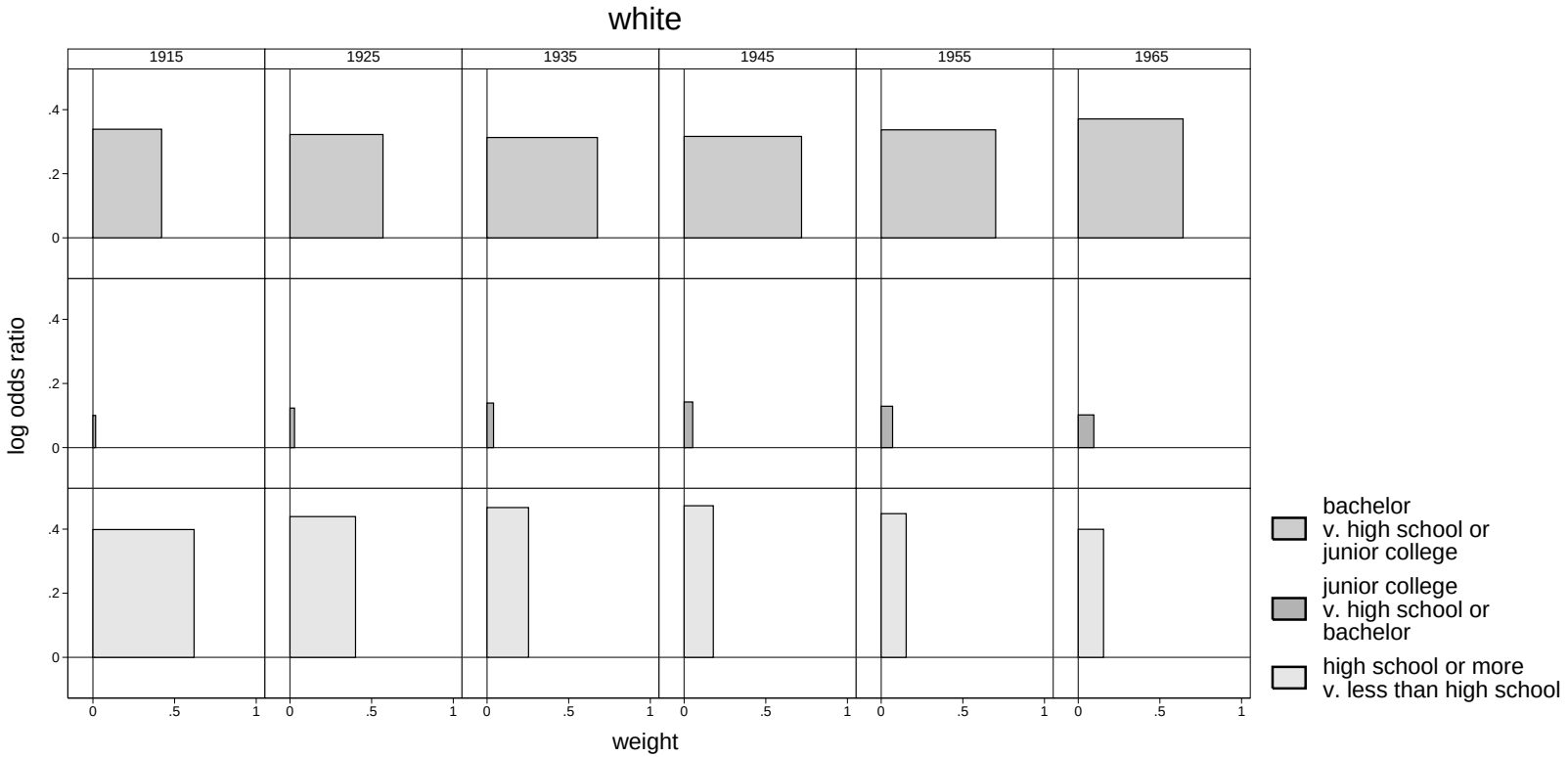
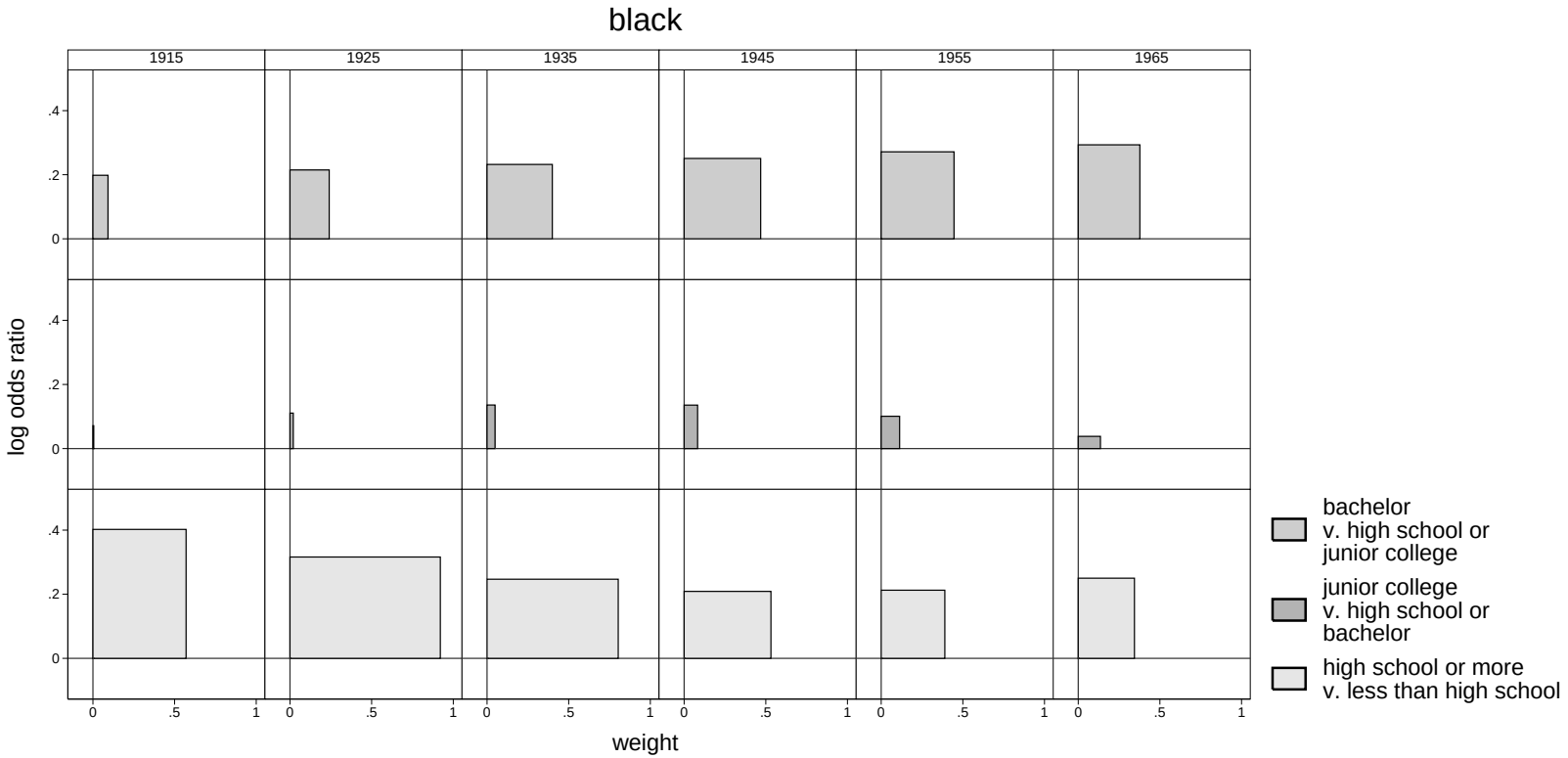


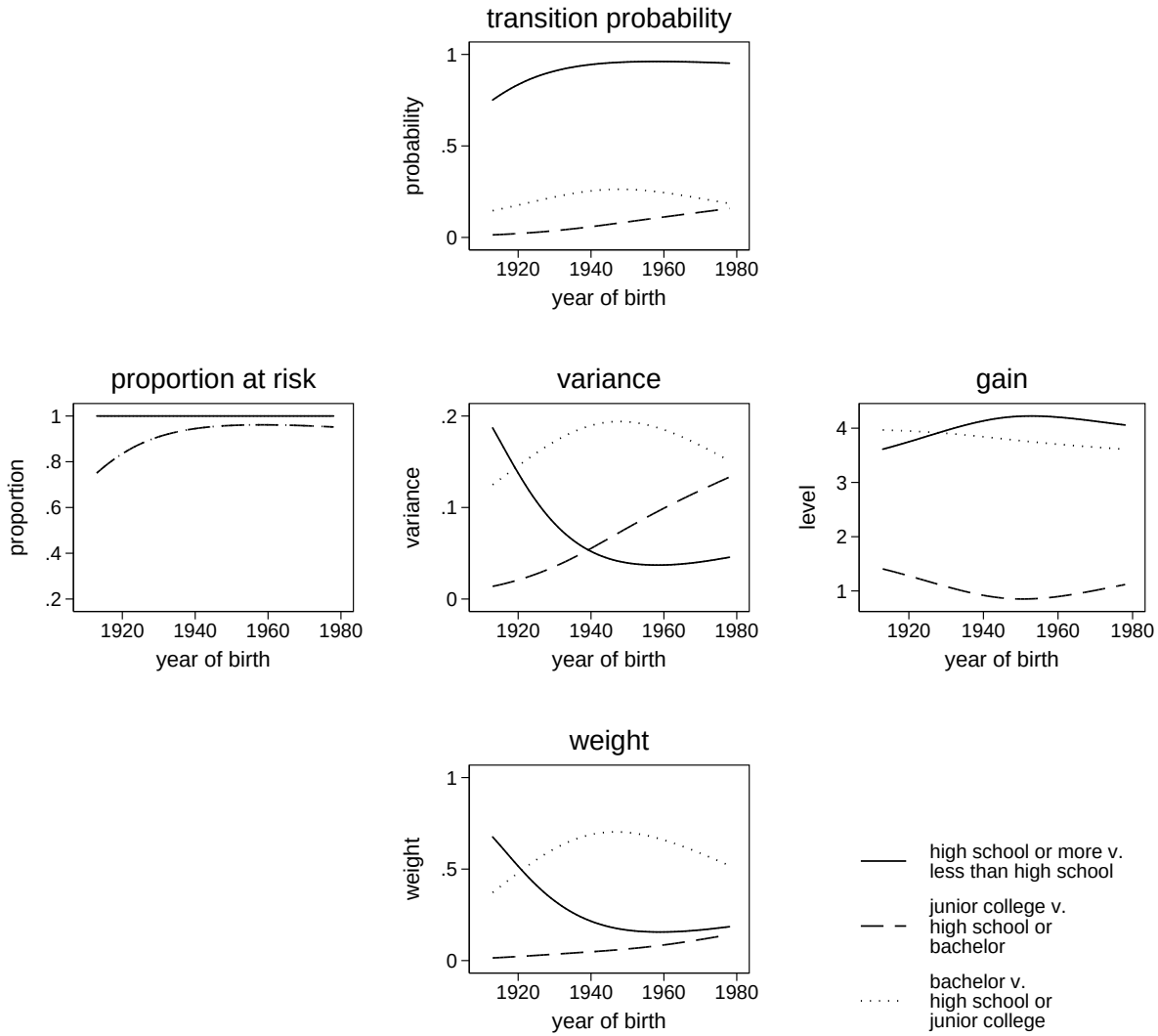
Decomposition of IEOut for white men



Decomposition of IEOut for black men



Decomposition of the weights for white men



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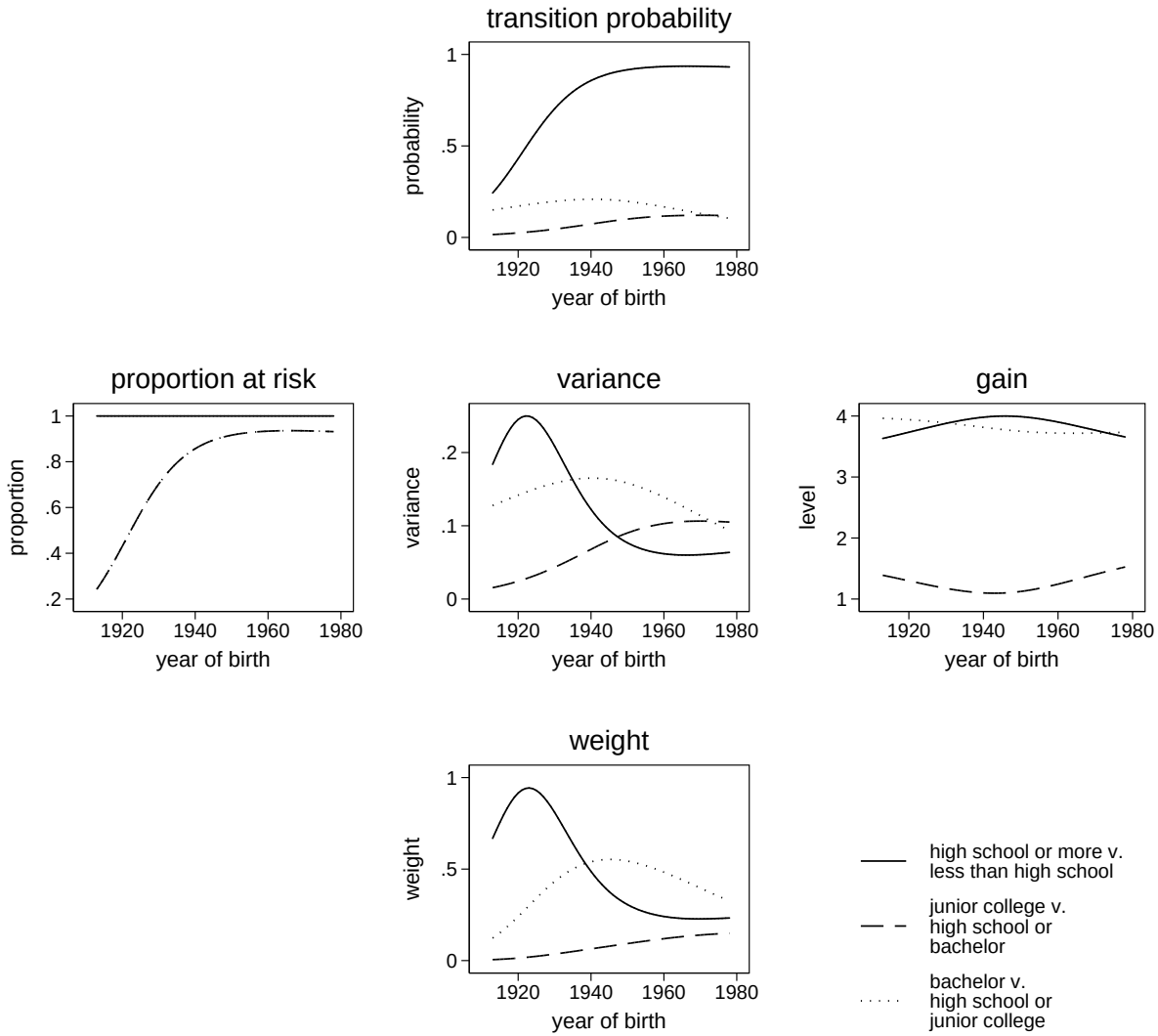

The `seqlogit` package

- These graphs where made with the `seqlogit` package in Stata.
- It can deal with any tree.
- To install type within Stata `ssc install seqlogit`.

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  - the proportion at risk increases,
  - the proportion that passes is closer to .50,
  - the expected increase in level of education increases

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  - to relate IEOut to the IEOpps.
  - identify important and less important transitions,
  - to explain differences in IEOut with well documented phenomena like educational expansion or racial differences in educational attainment.