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## Status attainment processes - individual path dependencies and the moderating role of education systems

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### Rationale

- Problems of status attainment models in international comparison
    - Comparable individual data
    - Comparable context variables
  - Path dependency of educational/occupational position
  - Inclusion of country variations
- Multilevel path analysis

# Key concepts

## Education systems

- Mass schooling
  - Mediating status attainment
  - Fortifying status assignment
- Skills or credentials?

## Skills formation

- Diversion effect
  - School segregation
- Specialisation effect
  - + Smooth entry into (medium) skilled employment
  - + Acquisition of skills; enabling lifelong learning

# Variables, individual level

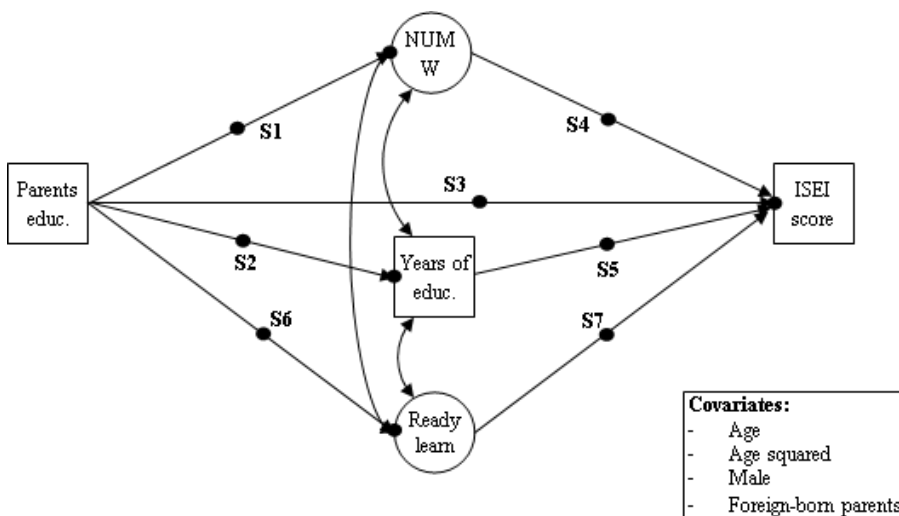
## PIAAC data

- 22 countries
- n=82,822
- Parental education (IV)
- Respondents' ISEI (DV)
- Respondents' educational attainment (MV)
- readiness to learn scale (MV)
- Adult skills (MV)

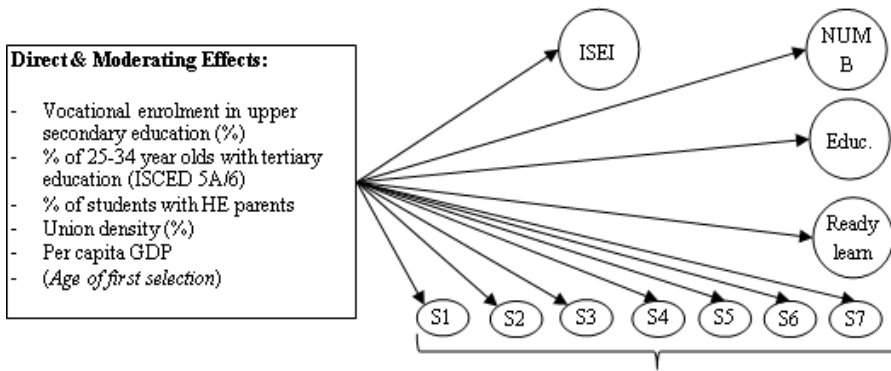
## Variables, country level

- System differentiation, vocational enrolment (Eurostat; Bol & van de Werfhorst)
- Tertiary education attainment among 25-34y (OECD)
- Students with HE background (PIAAC)
- Union density (ICTWSS)
- Economic wealth (OECD)

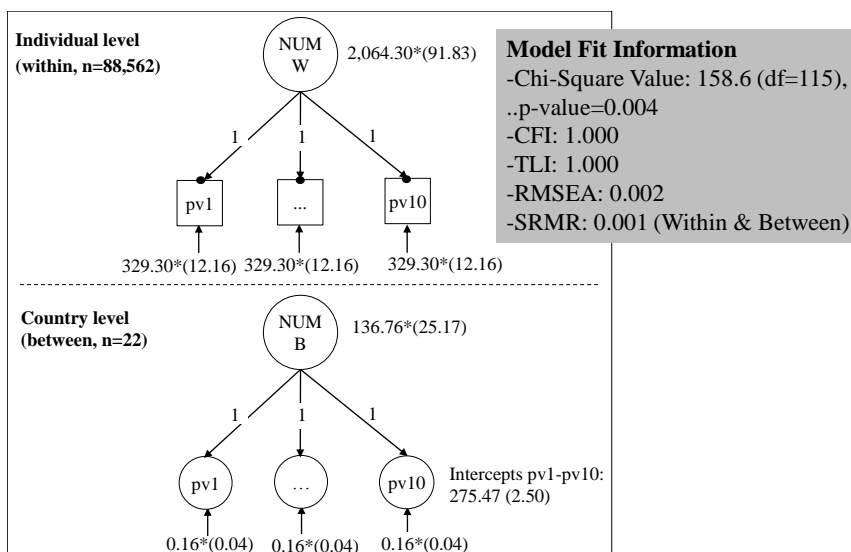
## The individual level model (within part)



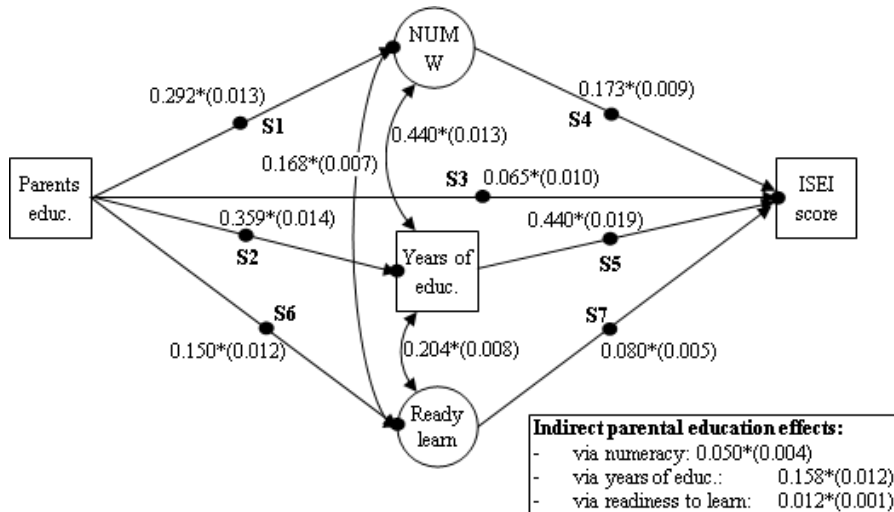
## The country level model (between part)



## Measuring numeracy skills: two-level CFA



## Individual level (standardized) estimates



## Country level estimates (standardized)

|                          | Numeracy             | Years of educ.       | Ready to learn        | ISEI Score     |
|--------------------------|----------------------|----------------------|-----------------------|----------------|
| Vocational enrolment     | <b>0.779*(0.148)</b> | -0.067 (0.183)       | <b>-0.405*(0.186)</b> | -0.038 (0.313) |
| % Students w. HE parents | <b>0.715*(0.147)</b> | -0.152 (0.230)       | <b>-0.665*(0.226)</b> | 0.046 (0.220)  |
| % ISCED 5A/6 (25-34)     | 0.160 (0.106)        | <i>0.418*(0.163)</i> | -0.224 (0.160)        | 0.151 (0.243)  |
| Union density            | 0.120 (0.091)        | 0.014 (0.219)        | 0.595*(0.129)         | 0.406 (0.357)  |
| Per capita GDP           | -0.040 (0.112)       | 0.213 (0.284)        | <b>0.307*(0.116)</b>  | 0.239 (0.238)  |
| Intercept                | 15.657*(2.569)       | 11.551*(2.017)       | 8.979*(1.620)         | 3.988 (2.436)  |
| R2 (between level)       | 0.864*(0.053)        | 0.234*(0.118)        | 0.450*(0.122)         | 0.405*(0.138)  |

## Moderating effects (cross-level interactions)

|                          | S1                    | S2                    | S3                    | S6             |
|--------------------------|-----------------------|-----------------------|-----------------------|----------------|
| Random slope ON          |                       |                       |                       |                |
| Vocational enrolment     | <b>-0.059*(0.029)</b> | <b>-0.007*(0.003)</b> | 0.011 (0.015)         | 0.001'(0.001)  |
| % Students w. HE parents | <b>-0.284*(0.050)</b> | <b>-0.038*(0.008)</b> | <b>-0.120*(0.021)</b> | -0.002 (0.001) |
| % ISCED 5A/6 (25-34)     | -0.129 (0.085)        | -0.013 (0.008)        | -0.041 (0.043)        | 0.002'(0.001)  |
| Union density            | -0.094*(0.028)        | 0.000 (0.003)         | -0.023 (0.015)        | -0.002*(0.001) |
| Per Capita GDP           | 0.247*(0.046)         | 0.001 (0.006)         | -0.024 (0.018)        | -0.001*(0.001) |
| Intercepts               |                       |                       |                       |                |
| Random slope             | 17.079*(0.688)        | 1.422*(0.068)         | 8.199*(0.252)         | 0.194*(0.009)  |
| Dependent variable       | 256.856*(1.491)       | 12.234*(0.150)        | 40.168*(0.795)        | 1.844*(0.068)  |
| Residual correlation     |                       |                       |                       |                |
| Random slope x DV        | -4.851'(2.482)        | -0.035 (0.029)        | -1.803*(0.725)        | 0.000 (0.002)  |

## Moderating effects (cross-level interactions)

|                          | S4                   | S5                   | S7                   |
|--------------------------|----------------------|----------------------|----------------------|
| Random slope ON          |                      |                      |                      |
| Vocational enrolment     | <b>0.020'(0.011)</b> | <b>0.017*(0.007)</b> | <b>0.032*(0.010)</b> |
| % Students w. HE parents | -0.007 (0.024)       | <b>0.025*(0.010)</b> | <b>0.048*(0.020)</b> |
| % ISCED 5A/6 (25-34)     | -0.023 (0.031)       | 0.010 (0.017)        | 0.011 (0.026)        |
| Union density            | -0.036'(0.020)       | 0.000 (0.008)        | -0.021'(0.011)       |
| Per Capita GDP           | 0.093*(0.042)        | -0.001 (0.014)       | -0.035*(0.014)       |
| Intercepts               |                      |                      |                      |
| Random slope             | 9.510*(0.268)        | 4.246*(0.121)        | 5.160*(0.160)        |
| Dependent variable       | 47.787*(0.727)       | 28.351*(0.912)       | 47.744*(0.546)       |
| Residual correlation     |                      |                      |                      |
| Random slope x DV        | -0.345 (0.431)       | -1.277*(0.456)       | 0.578 (0.376)        |

## Summary – main findings

- Influence of families on status attainment works through education: credential more important than skills
- Path dependencies vary across countries
- Differentiation in upper secondary education translates into lower family effects in educational achievement and a higher average skill level in a country
- Share of students with HE parents also diminishes family background effects and increases the effect of educational attainment and readiness to learn on ISEI

## Some Limits

- Numeracy and literacy are generic skills with varying relevance in vocational/occupational contexts
- Cross-section data: different age cohorts in individual data are confronted with recent country level data (however, results are essentially the same when modelling young cohorts only)
- Sample selectivity (only 60% of total sample are in jobs)
  - How to model that in a multilevel framework (Heckman correction at individual level)?
  - Preliminary analysis shows that the probability of selection ( $job=1$ ) is independent of country variation in our contextual variables

Thank you!

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