

Cognitive Skills among Adults: An Impeding Factor for Gender Convergence?

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Gender Differences in the Labor Market

- **Convergence of gender gaps in labor market outcomes** over time in most OECD countries (Bertrand 2020)
- Remaining gaps seem to be especially related to decisions regarding **field of study, children, and non-wage job characteristics** (Goldin 2014, Bertrand 2020) → *Choices? Preferences? Norms?*
- Occupational choices around fertility have important consequences for labor market skills (Adda et al. 2017)

Research Questions

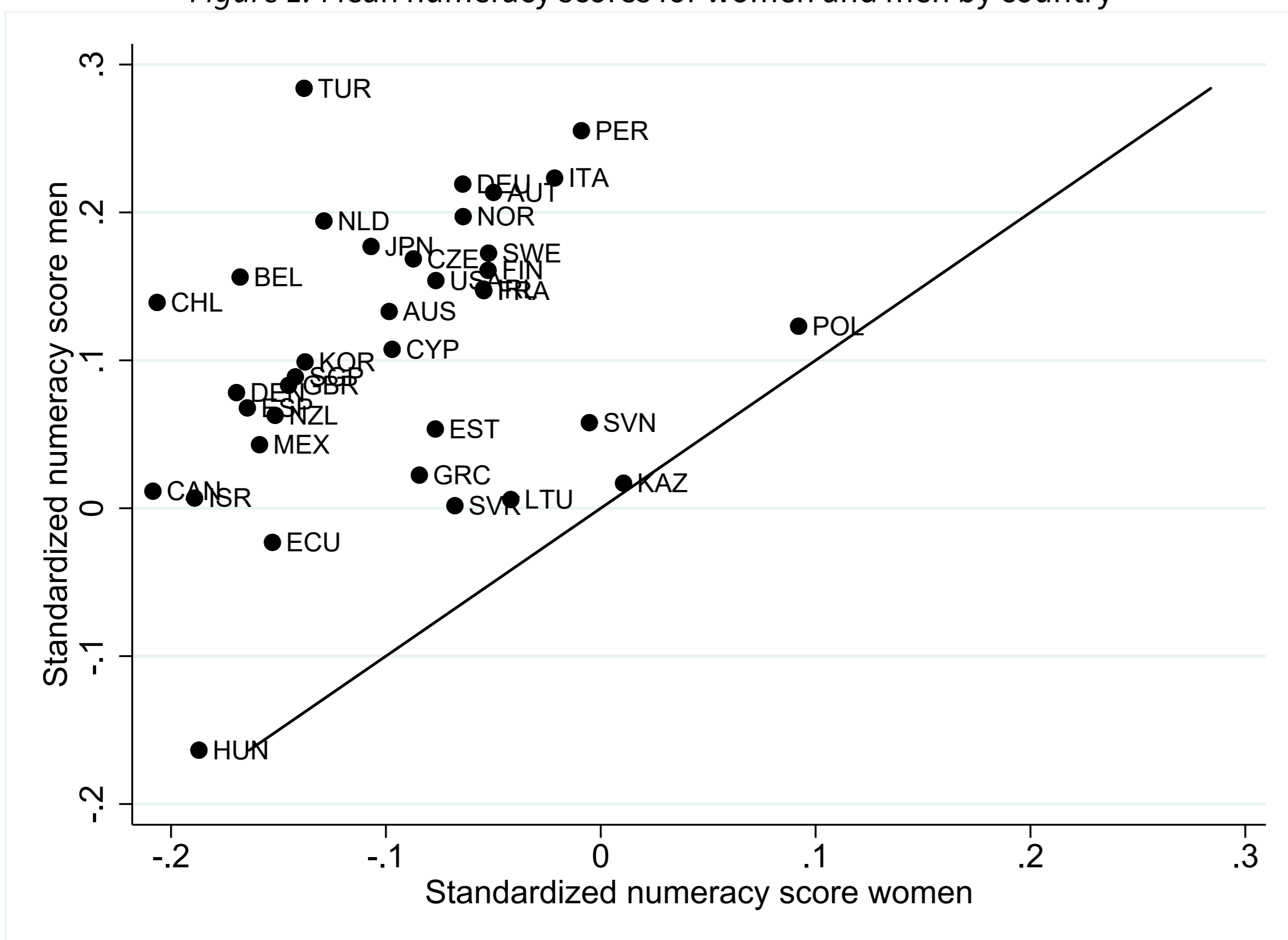
- How do skills among adults differ between men and women?
 - What are the main **explanatory factors**?
 - How do skill gaps **translate into wage gaps**?
 - Are skills of men and women valued differently by the market?
- Focus on **numeracy skills** since they have shown to be most predictive of wages (Hanushek et al. 2015)

Data: Survey of Adult Skills (PIAAC)

- Datasets:
 - PIAAC international 2012 (37 countries, individuals aged 16-65)
 - PIAAC-L panel for Germany only (2012 and 2015)
- Main outcomes:
 - numeracy, literacy, problem solving skills
 - hourly wages
- Sample restrictions: drop all individuals aged 16-19

Numeracy Gender Gaps across Countries

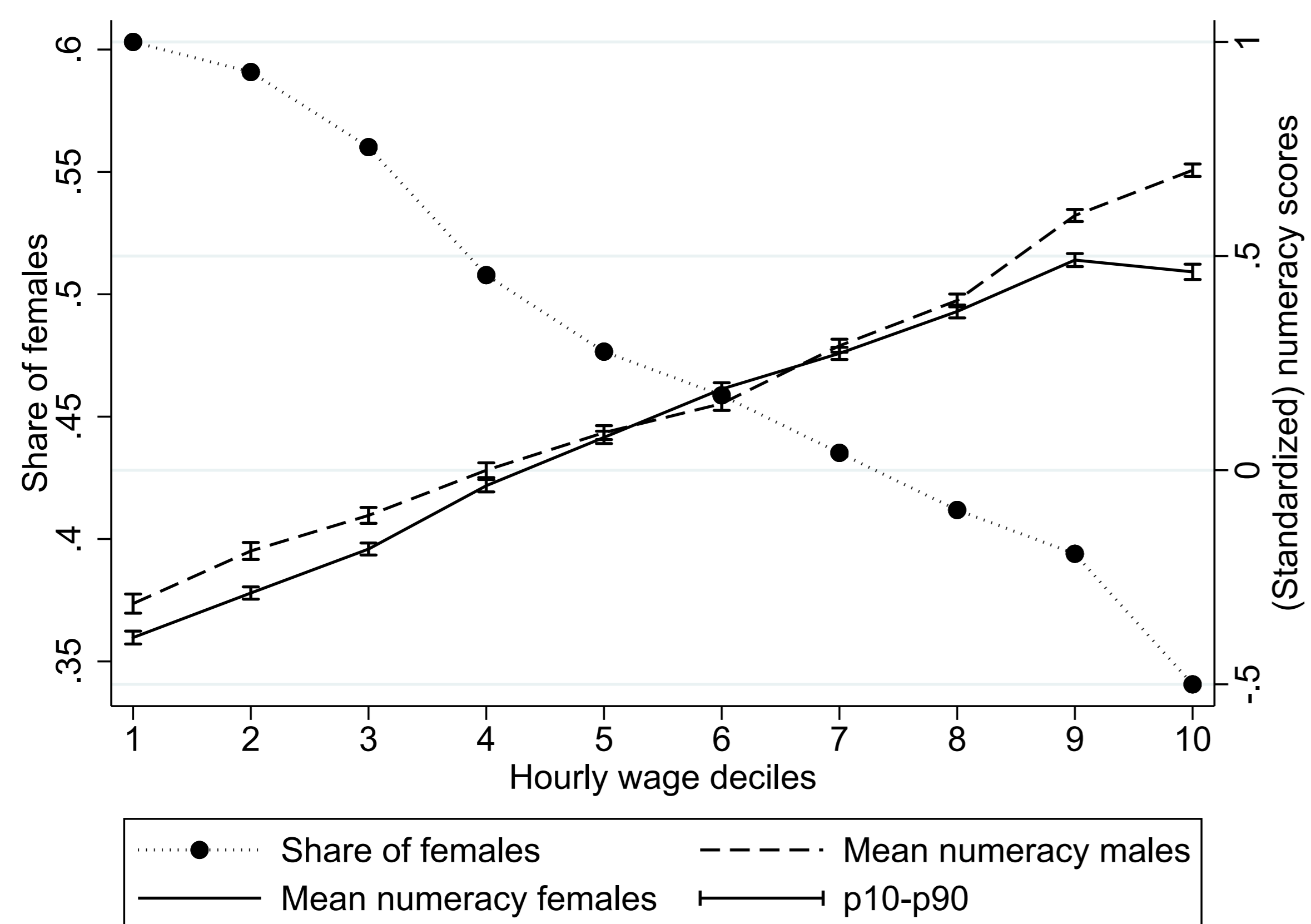
Figure 1: Mean numeracy scores for women and men by country



Notes: Standardized numeracy scores for men and women by country as well as a 45-degree line. Standardization uses individuals' sampling probability. Sample contains all individuals with non-missing data for numeracy scores. Data source: PIAAC international PUF 2012.

Numeracy Gender Gaps along the wage distribution

Figure 2: Share of females and female/male numeracy scores across the hourly wage distribution



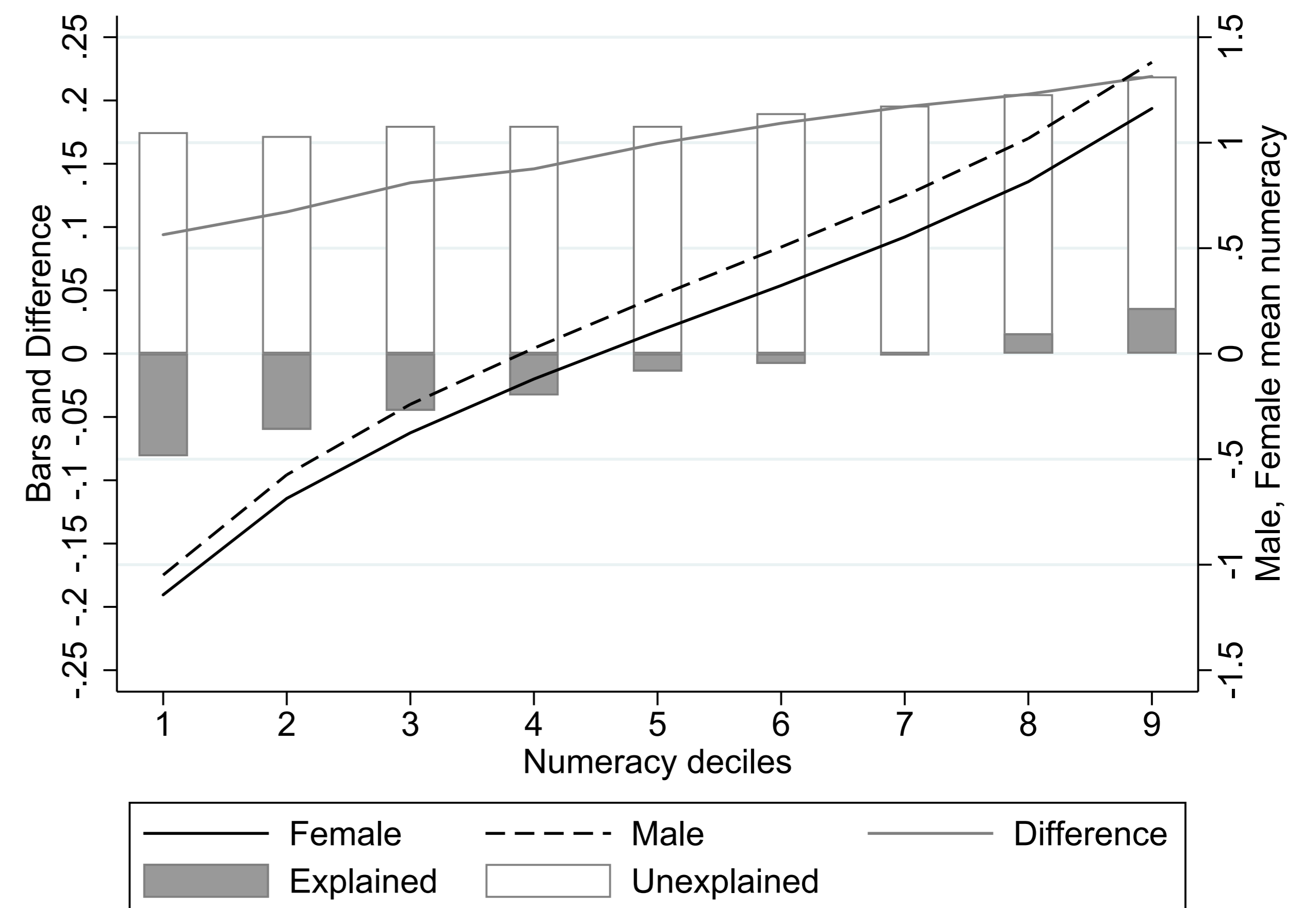
Notes: (Weighted) Shares of females within the respective deciles of hourly wages and standardized numeracy scores for men and women. Standardization uses individuals' sampling probability. Sample contains all individuals with wage information. Data source: PIAAC international PUF 2012.

Conclusion

- Large gender differences in numeracy skills, especially among adults with children and in STEM fields of study
- Policy Relevance: Understanding the determinants of gender gaps in skills has important implications for gender wage gaps as well as the labor-market decisions women take

Decomposition of Gender Gaps in Numeracy Skills

Figure 3: Decomposition of gender numeracy gap in explained and unexplained part, by decile



Notes: Oaxaca-Blinder type decomposition of numeracy gaps by gender using the command `oaxaca_rif`, for employed individuals only. Explanatory variables used: age groups, children, education, field of study, occupation, and country dummies. Data source: PIAAC international PUF 2012.

Decomposition of Gender Gaps in Numeracy Skills

Figure 4: Decomposition of the explained part, by decile

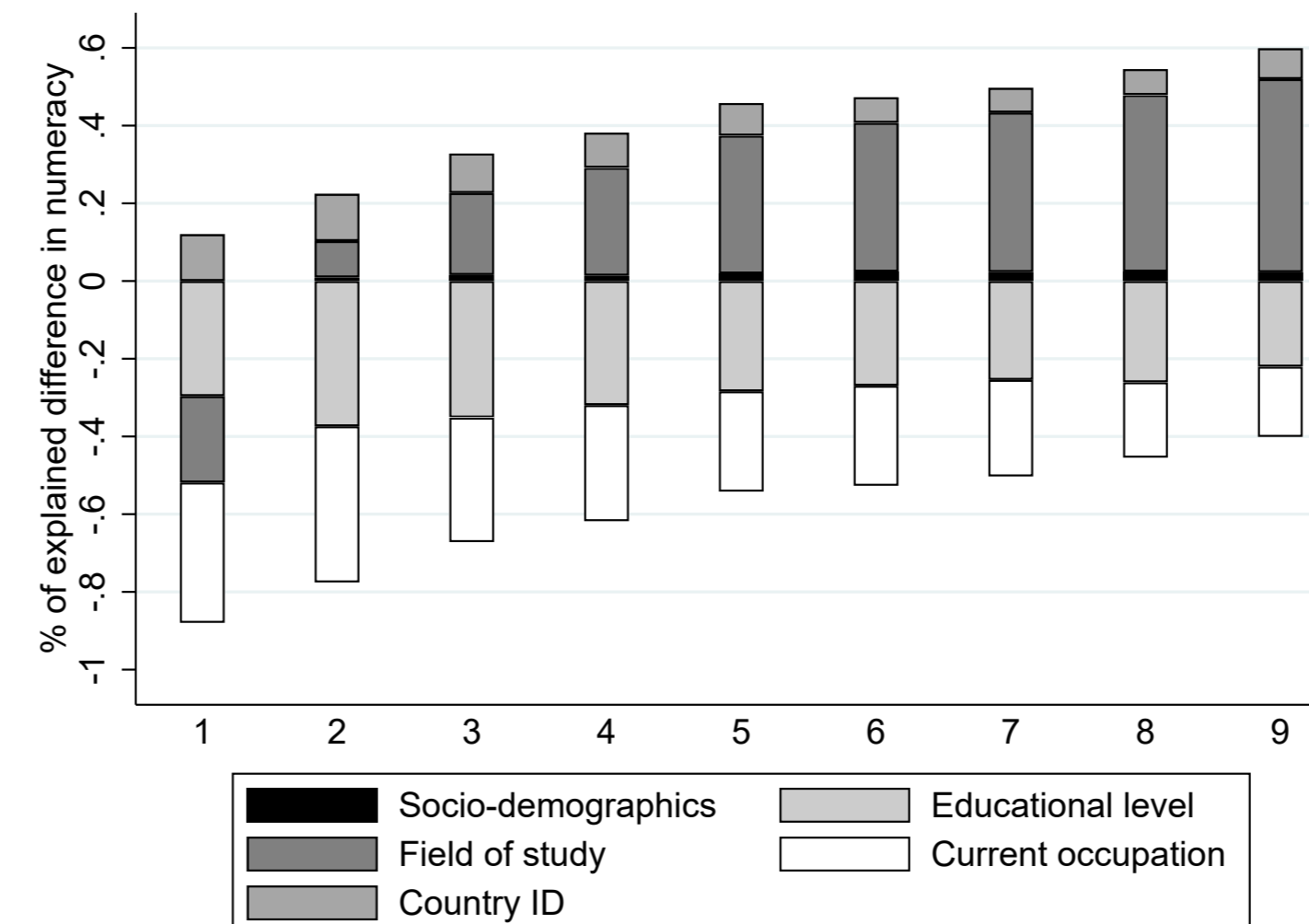
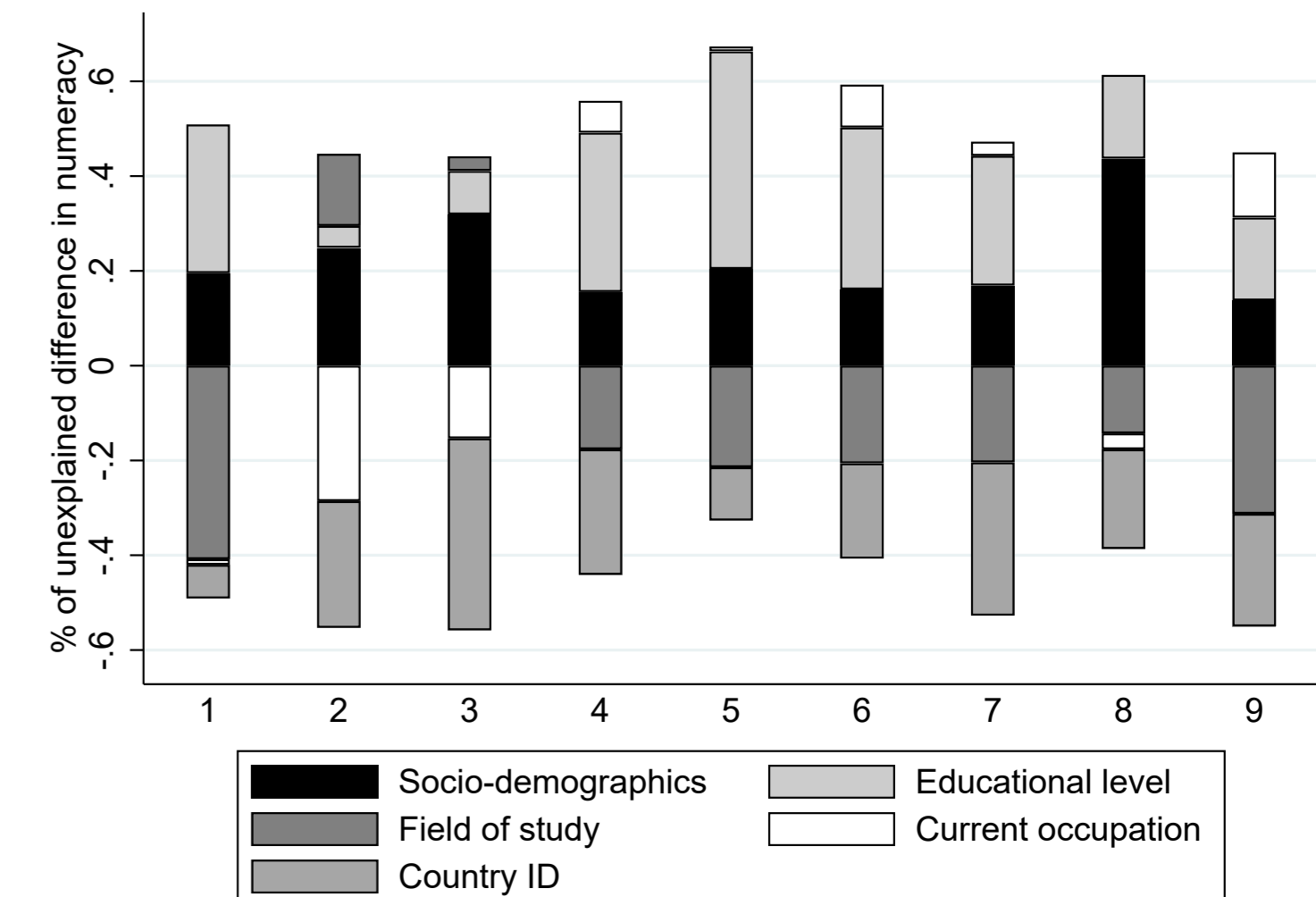


Figure 5: Decomposition of the unexplained part, by decile



Notes: Oaxaca-Blinder type decomposition of numeracy gaps by gender using the command `oaxaca_rif`, for employed individuals only. Explanatory variables used: age groups, children, education, field of study, occupation, and country dummies. Data source: PIAAC international PUF 2012.

Possible Explanations for Gender Gaps in Numeracy Skills

Figure 6: Mean numeracy for women and men by age and children

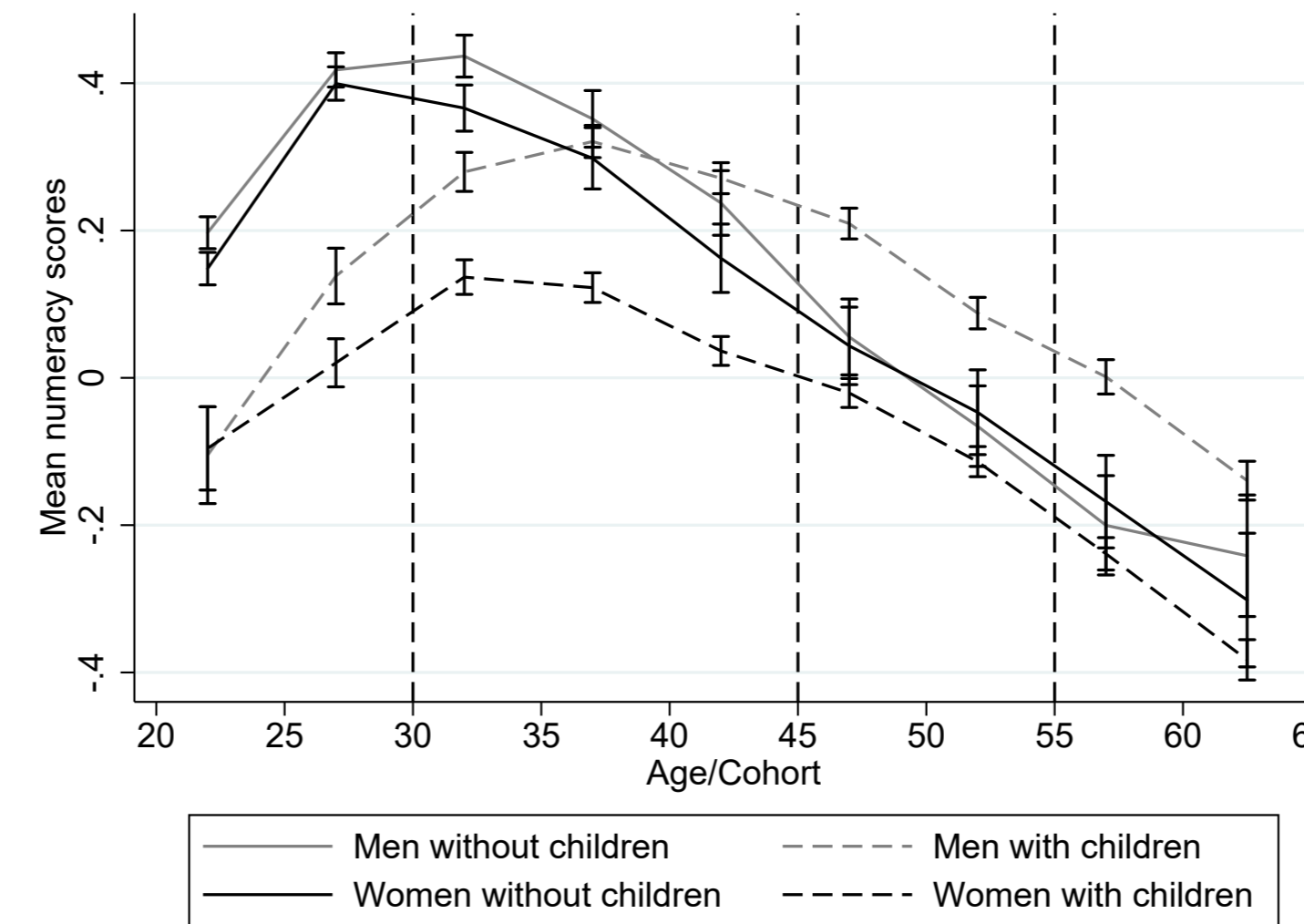
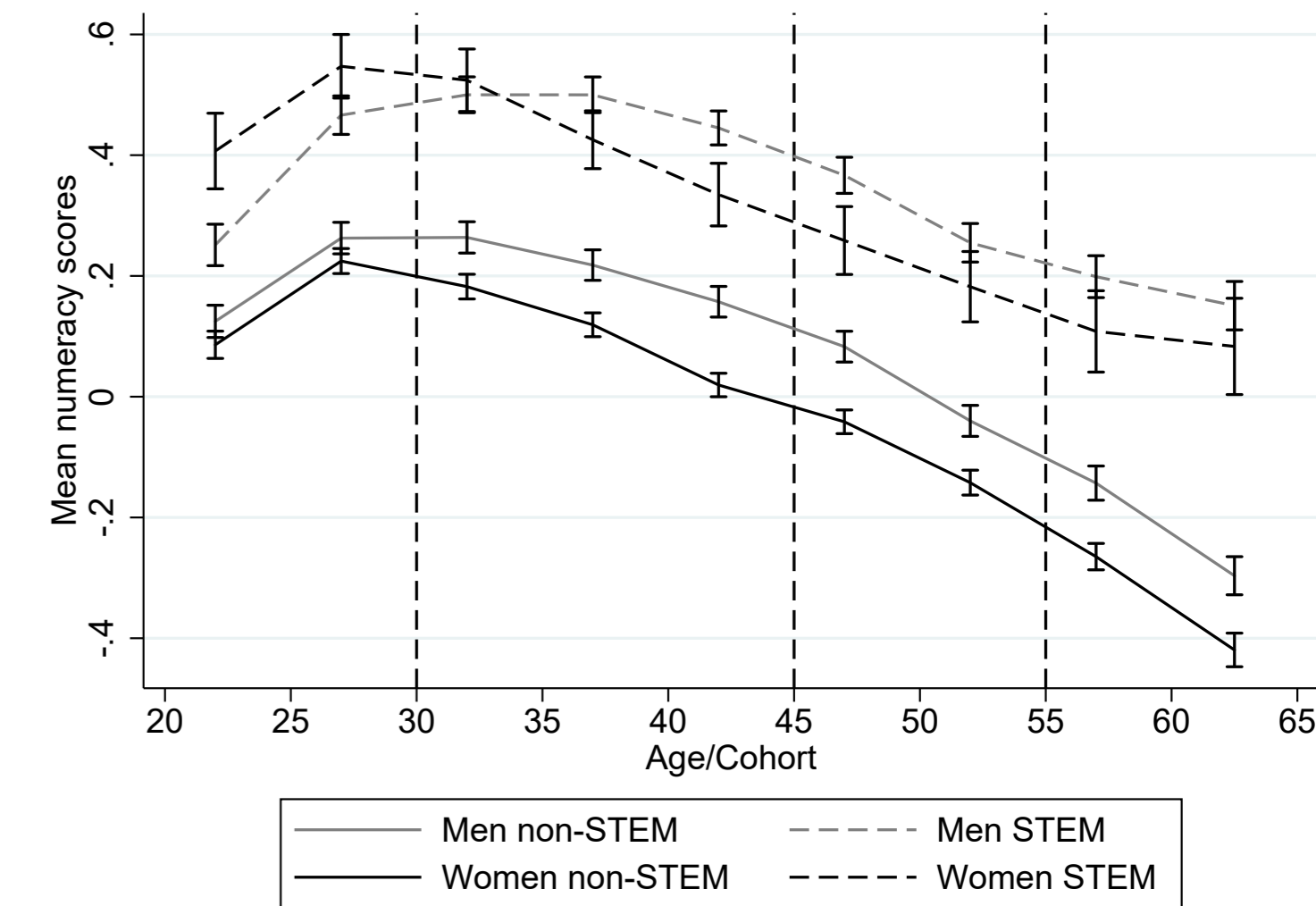


Figure 7: Mean num. for women and men by age and field of study



Notes: Mean standardized numeracy scores by age (in 5-year intervals) for men and women with and without children and for STEM/non-STEM fields of study. Confidence intervals for each data point are added, vertical lines represent cutoffs of age groups in the regressions at age 30, 45, and 55. Standardization uses individuals' sampling probability. Sample contains all employed individuals with non-missing numeracy scores, age, and child information/field of study respectively. Data source: PIAAC international PUF 2012.

Returns to numeracy skills along the hourly wage distribution

Figure 8: Returns to above-median numeracy skills for men and women with and without children by hourly wage decile

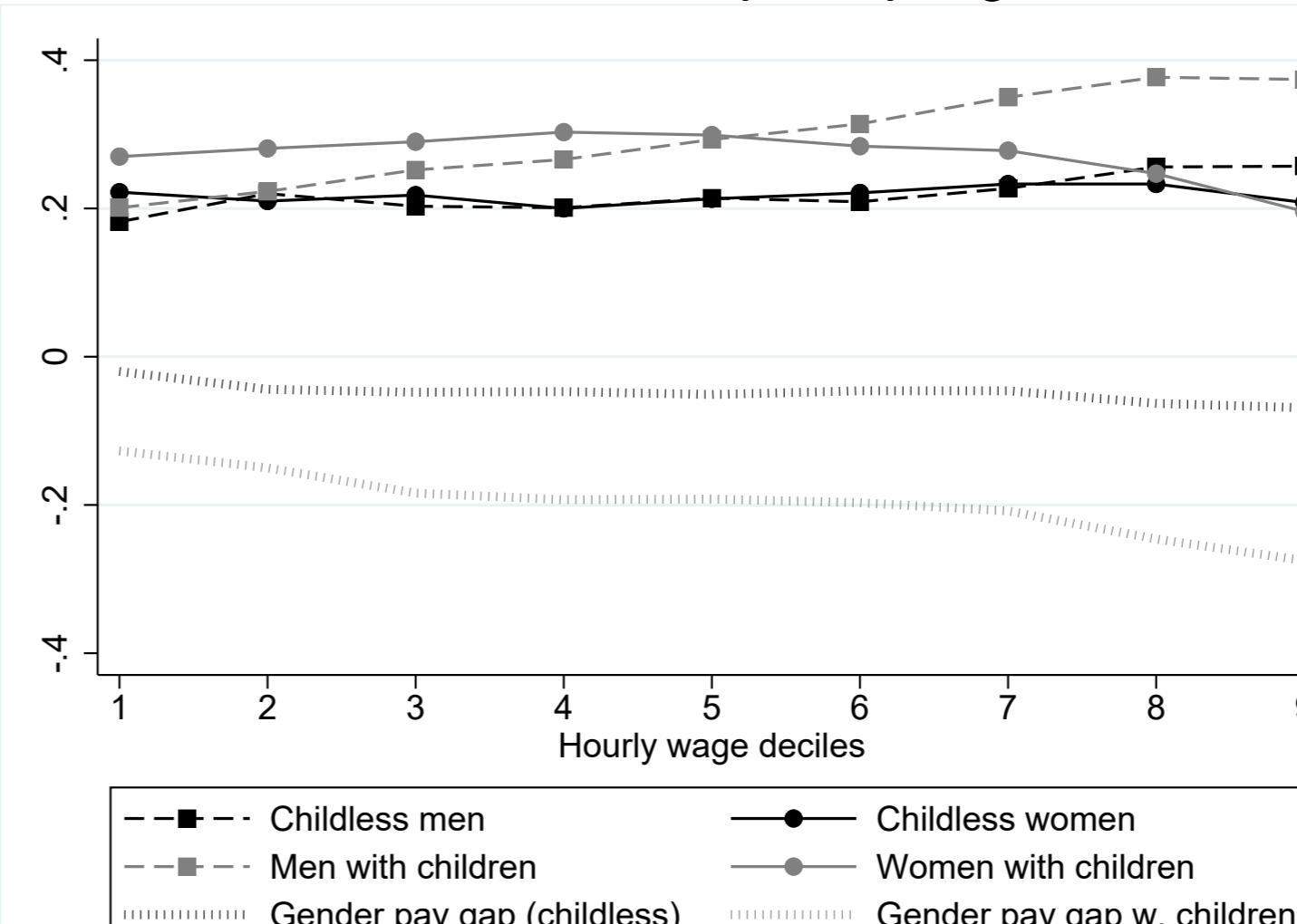
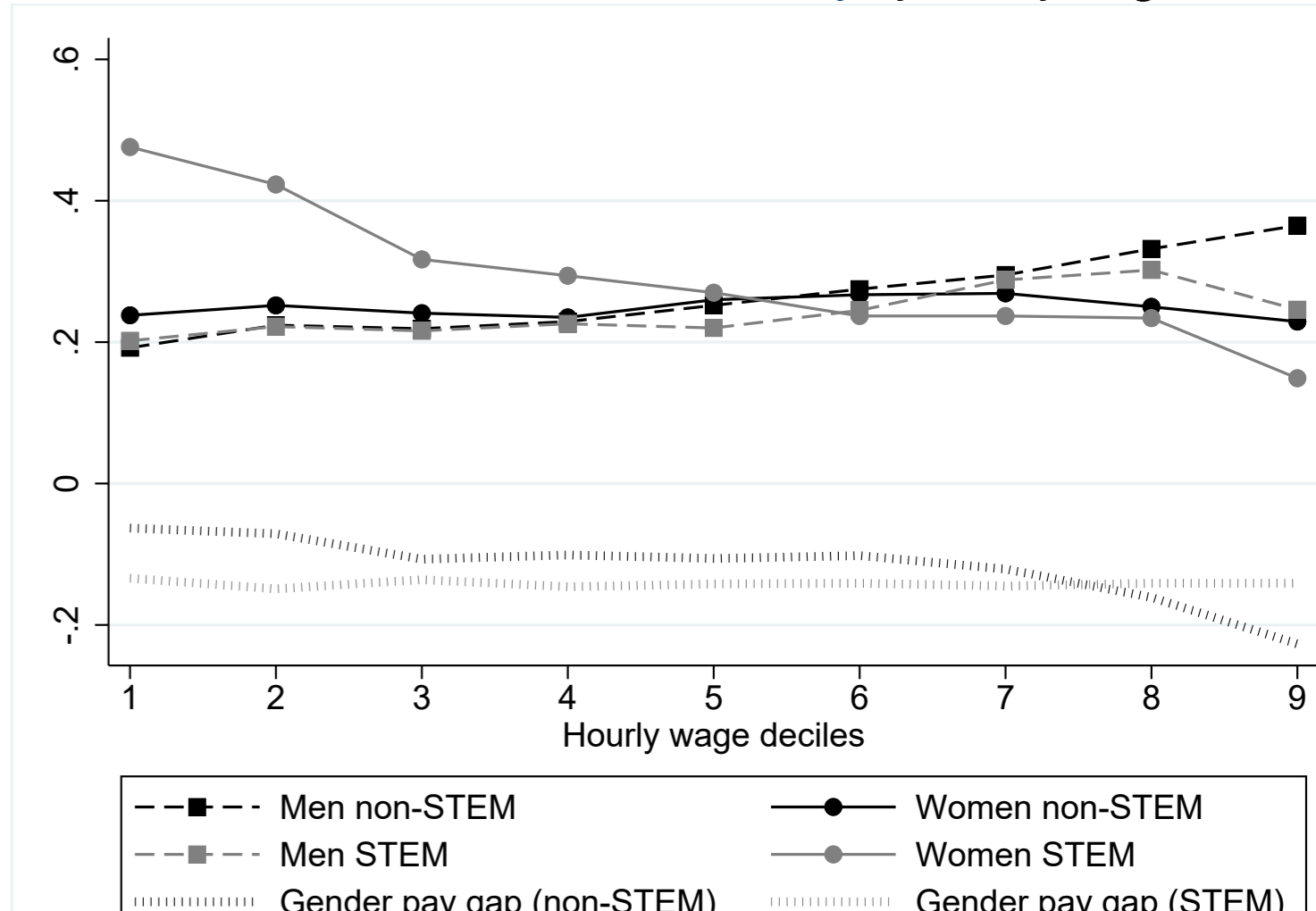


Figure 9: Returns to above-median numeracy skills for men and women in STEM/non-STEM fields of study by hourly wage decile



Notes: Relative returns to above-median numeracy levels for men and women by having children/field of study. The dotted lines plot the marginal effect for females respectively. Numeracy scores are standardized using individuals' sampling probability. Sample contains all individuals with non-missing wages, numeracy scores and information on children/field of study respectively. Data source: PIAAC international PUF 2012.