

Women's social empowerment and gender differences in adults' cognitive competences.

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Abstract

Female social empowerment via changes in gender roles and gender equity has the potential to enhance women's cognitive abilities. Our results from previous work investigating the role of gender equity in education and improved living conditions during early adulthood suggest that European women gain more from societal improvements over time than their male counterparts. The aim of this study is to extend this work by investigating the association between women's social empowerment during childhood and early adulthood and gender differences in cognition of people at working age for more than 30 OECD countries. We analyze the three established cognitive competences measures literacy, numeracy and problem solving, which are key skills for labor market participation. Using the national survey data PIAAC collected within three rounds in 2011, 2014, and 2017, we will apply mixed effect models to analyze the association of female social empowerment earlier in life on gender differences in the three cognitive key competences. Our preliminary findings suggest that gender roles and gender equity factors associated with women's empowerment, are more beneficial for women's cognitive key competences than men's.

Introduction

The goal of this study is investigating the role of women's empowerment (e.g. gender roles and gender equity) during an early life-course on three different cognitive key competences (i.e. literacy, numeracy as well as problem solving in technology-rich environments). So far, we know that there is a great variability in cognitive functioning among individuals within and between countries (Herlitz et al. 2016; Skirbekk et al. 2012; Weber et al. 2014, 2017). For instance, gender differences in cognitive functioning are well documented with men outperforming women on visuospatial tasks and mathematical tasks (Guiso et al. 2008; Voyer et al. 1995) and women having an advantage in episodic memory (Asperholm et al. 2019; Herlitz and Rehnman 2008; Weber et al. 2014).

Societal factors have been shown to influence cognitive gender differences (Miller and Halpern 2014). Some studies show that gender-equality is positively associated with women's math performance (Else-Quest et al. 2010; Guiso et al. 2008), whereas others did not find such an association in adolescents (Stoet and Geary 2013, 2015). However, societal factors are often based on the experience of earlier cohorts and research investigating societal factors such as gender equity during an individual's childhood or early adulthood are very limited, so far. This study aims to make a step ahead by investigating women's social empowerment (e.g. gender roles and gender equity) during childhood and early adulthood on cognitive key competences of people at working age in OECD countries. Avoiding underperformance in cognitive key competences in a large part of a country's population (i.e. female population) is highly relevant for their labor market participation.

Data and Methods:

We investigate the OECD data Programme for the International Assessment of Adult Competencies (PIAAC), which was collected in 24 countries between 2011 and 2012 with nine additional countries joining 2014/15 and a third round collected in 2017. At least 5,000 participants per country at working age (i.e. aged between 16 and 65 years) and living in private households were tested on three key competences required for labor market participation and daily routine. The three competences in literacy, numeracy as well as problem solving in technology-rich environments were addressed by eight tasks each.

Historic women's empowerment factors are retrieved from several data sources such as OECD, United Nations World Population Prospects, World Bank and Wittgenstein Centre. These country-, cohort- and gender specific women's empowerment factors (i.e. life expectancy, gross national income, infant mortality rate, human development index, employment rate, and mean years of education) are merged to a composite indicator with principal components analysis to capture different dimensions of women's empowerment during childhood and early adulthood.

To investigate the role of women's empowerment factors on gender differences in the three key competences, a cross-sectional approach will be applied. More specifically, mixed effect models such as random intercept regressions, will be applied to a pooled sample merging all countries, which allows accounting for heterogeneity between countries (Raudenbush and Bryk 2002). These models incorporate the particular data structure; that is, participants are nested in a geographical area (e.g. their countries of

residence) as randomly selected participants living in the same country tend to be more alike than randomly selected participants.

Preliminary findings

Our analysis reveals some gender differences in the three cognitive competences literacy, numeracy and problem solving for people aged 15 to 65 years across OECD countries. Whereas there is only a minor gender difference or even no difference in literacy, gender differences in numerical competence vary from a minor male advantage to a large male advantage over women across OECD countries. The competence of problem solving shows a more diverse pattern across countries and within countries. For instance, men in Japan show a big advantage in problem solving, while in Greece younger women, in particular, show an advantage in this competence.

Investigating the role of women’s empowerment during childhood and early adulthood with mixed effect models (i.e random intercept models), our preliminary results highlight that in countries with higher female empowerment and more gender equality, performance on the three cognitive competences is also higher. Further, a significant interaction between the women’s empowerment and gender demonstrate that women’s competence is higher in countries with more gender equality. Thus, these preliminary results suggest that gender role and gender equity factors associated with women’s empowerment, are more beneficial for women than men.

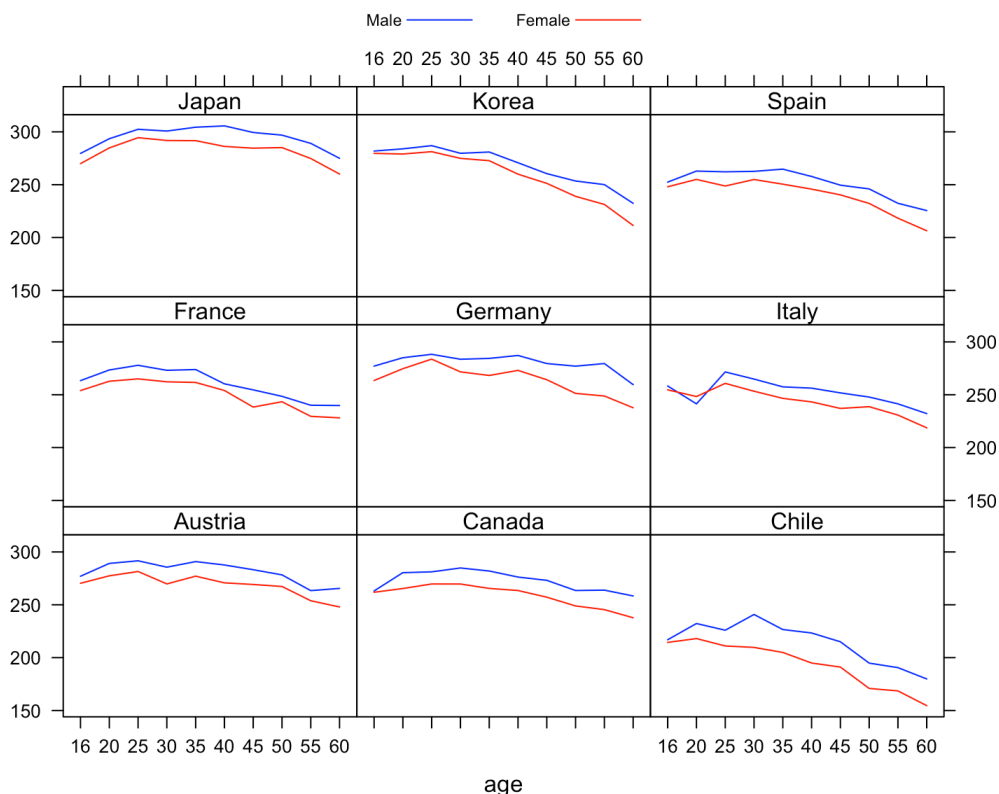


Figure 1: Numerical competence of men and women aged between 15 and 65 years in selected OECD countries.

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