

GxE INTERACTION IN DEPRESSION: LATE-CAREER UNEMPLOYMENT, RECESSIONS, AND GENDER DIFFERENCES

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Question

Are genetic influences on depression moderated by unemployment experience?

Hypothesis

- Genetic influences on depression is greater among adults experiencing late-career job loss in comparison to those stay employed.
- Genetic influences on depression are further moderated by the historical time of unemployment, i.e. periods of recession.
- There are gender differences in moderation patterns.

Project Overview

Mental health is a global health concern. Particular attention is given to depression, which is not surprising given the alarming statistics that demonstrate the scale of this problem. This study aims to demonstrate that an individual's susceptibility to depression among people aged 50-62 is a consequence of the interplay between genes, employment status, and historical context such as recession.

Data

The Health and Retirement Study (HRS) - Analytical sample includes European ancestry people aged between 50 and 62 (before eligibility for Social Security benefits), who were in labour force: 1,946 men (6,331 observations) and 2,517 women (8,519 observations).

Variables

Controlled variables

Depression episodes experienced before, age, marital status, type of area, region, education, childhood SES, lifestyle, longest tenure occupation and no. of years, household income and wealth, birth cohort

Independent variables

- Depression MTAG-based PGS (Turley et al., 2018);
- Unemployment status;
- Unemployment x Recession period

Dependent variable

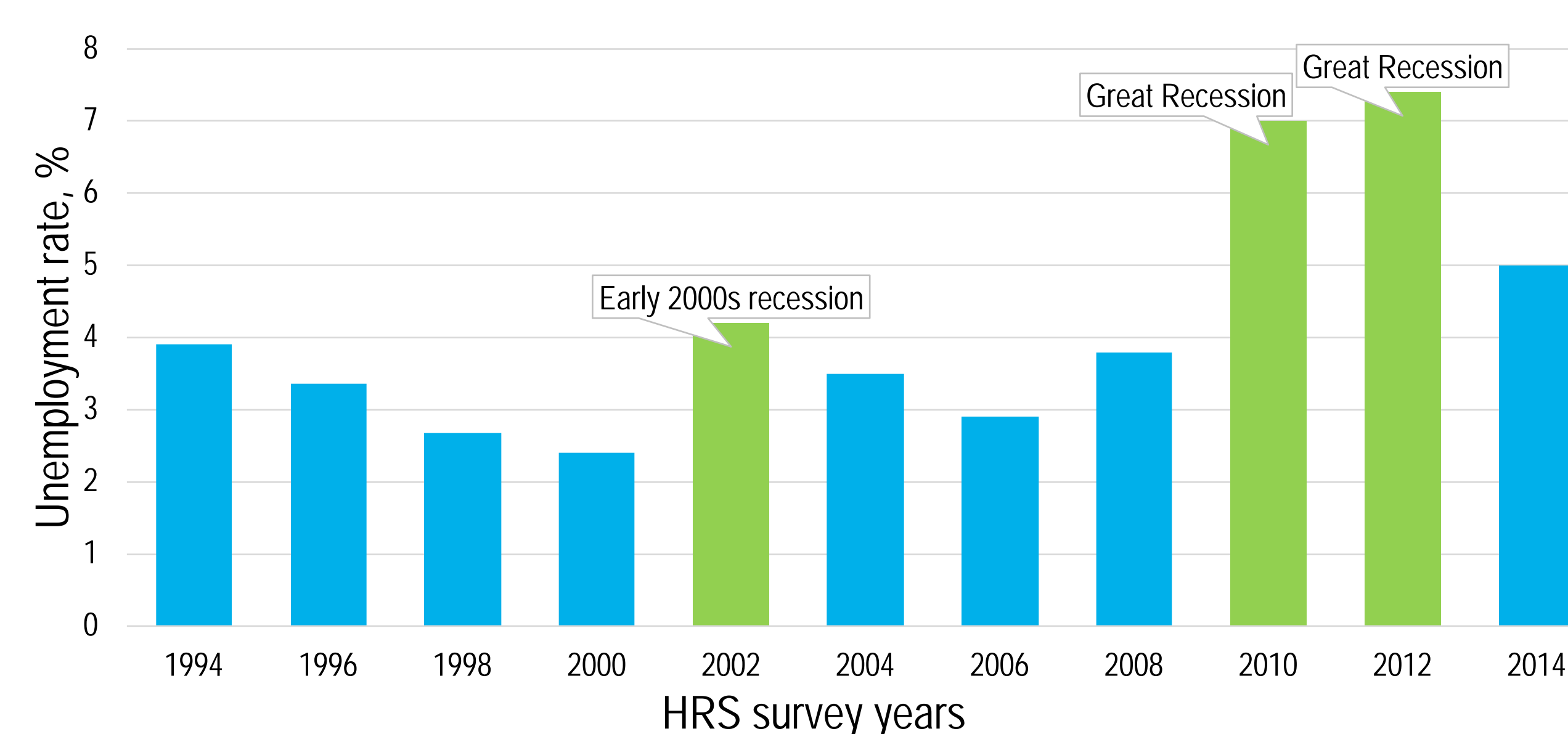
- Center for Epidemiologic Studies - Depression Scale (CES-D) | 8 items

Observations

Main variables: means, std. dev.

	Males	Females
CESD Depression Score	1.2 (1.3)	1.4 (1.5)
Depression MTAG-based PGS	-.01 (.1)	-.01 (.1)
Employment Status		
Unemployed	.6 (.2)	.5 (.2)
Employment Status x Recessions		
Employed (No Recession, %)	56.3	56.9
Employed (Recession, %)	38.1	37.8
Unemployed (No Recession, %)	2.7	2.8
Unemployed (Recession, %)	2.9	2.5

Unemployment Rates (for workers aged 50-62) and Recessions in the US, 1994-2014



Methods

The interaction effects are examined using multilevel models.

$$\text{Level 1: } \log CESD_{it} = \beta_1 PGS_i + \beta_2 Unempl_{it} + \beta_3 PGS_i \times Unempl_{it} + \sum_p \gamma_p C_{pi} + \sum_q \gamma_q C_{qit} + \varepsilon_{it}$$

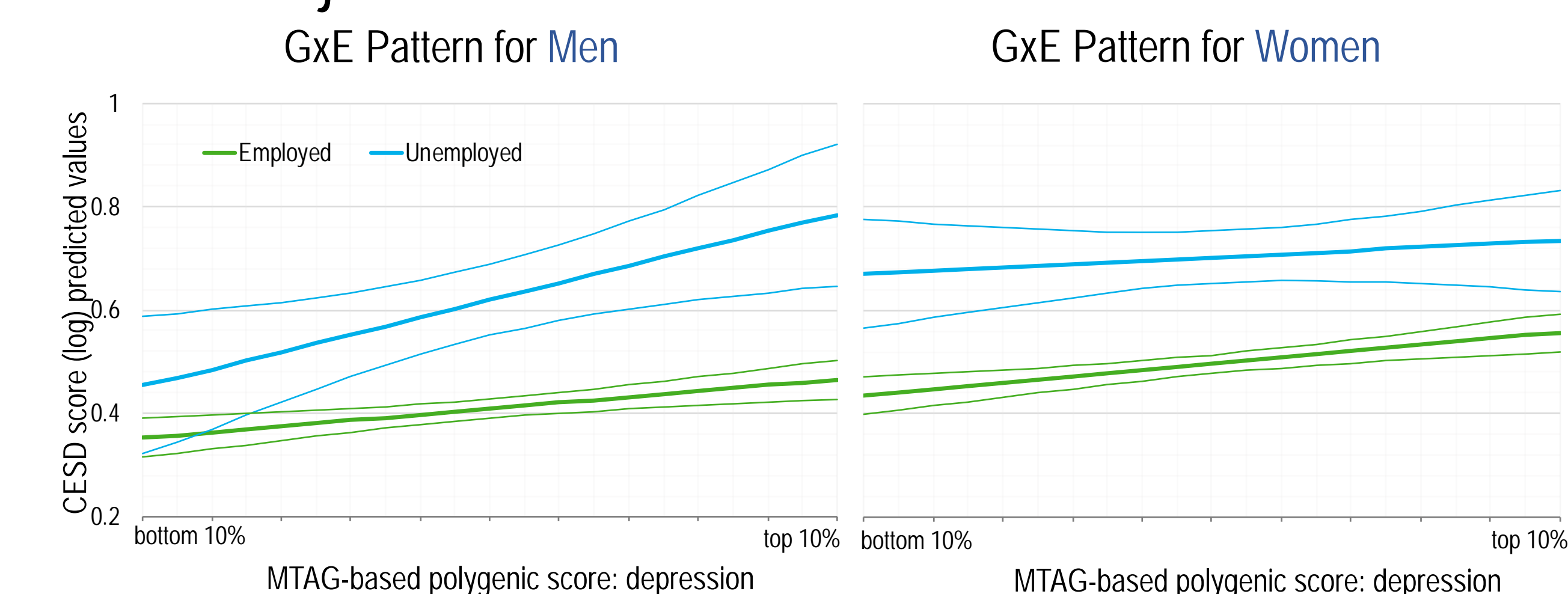
$$\text{Level 2: } cov(\log CESD_{it_1}, \log CESD_{it_2}) = \sigma^2 p^{|t_2 - t_1|}$$

References

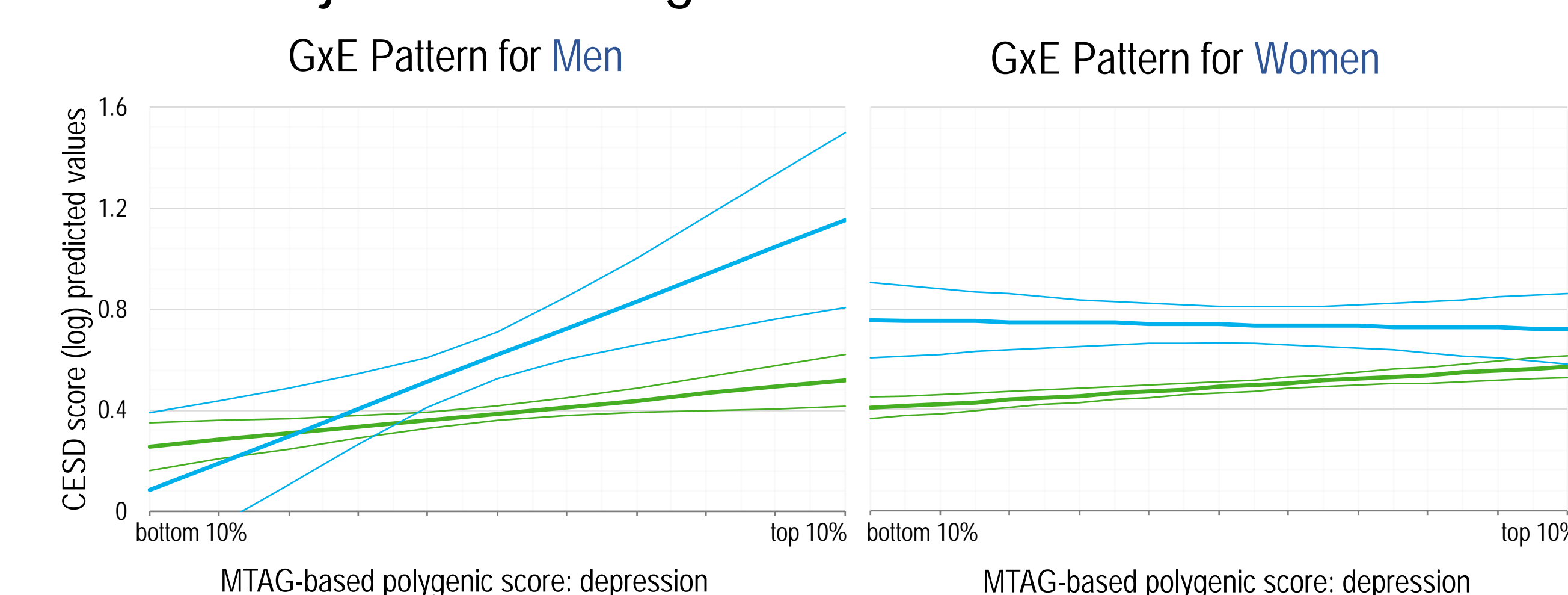
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Results

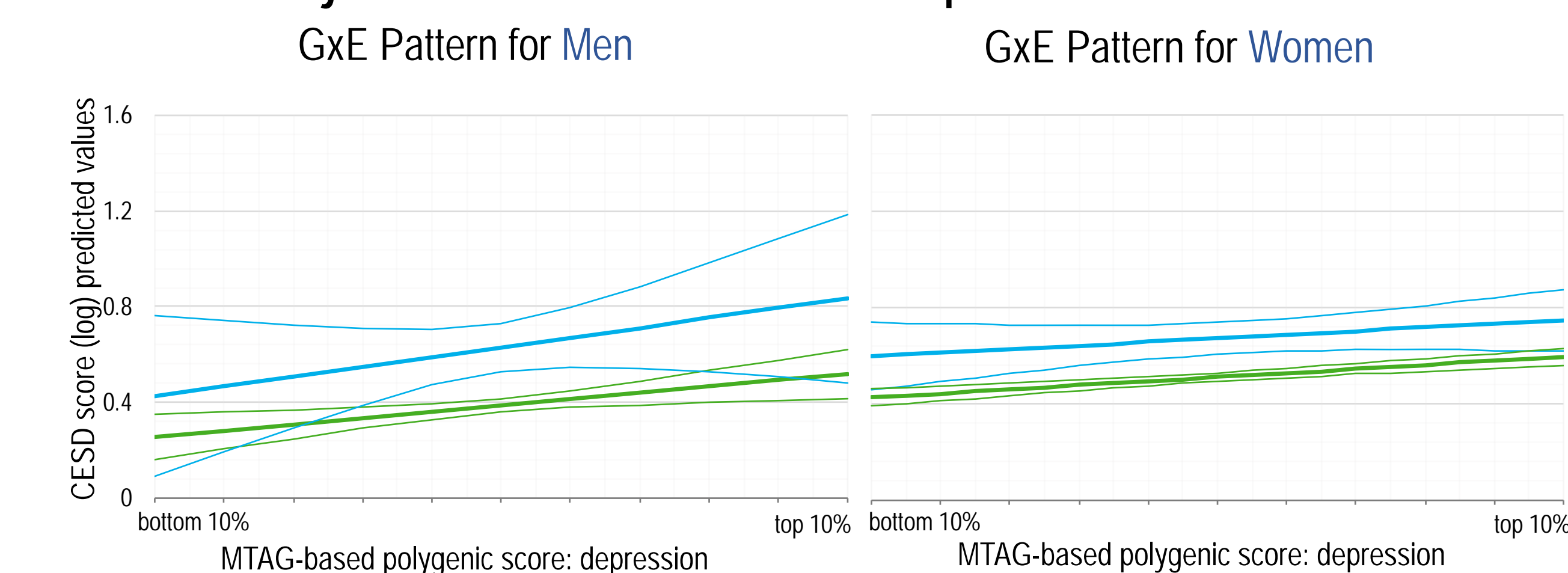
Late-career job loss and GxE



Late-career job loss during recessions and GxE



Late-career job loss in no recession periods and GxE



Conclusions

Late-career job loss moderates genetic association with depression

- Small and significant trends were found both for men and women; however, the patterns are different for genders.

Also matters when: unemployment during recessions

- Larger and significant interaction effects were found; the patterns are different among genders as well. However, job loss during no recession periods do not moderate genetic association with depression.