

## Introduction

### ○ Motivation

- 17% of adolescents and 8% of adults suffer from major depressive disorder in the US.
- Understanding determinants of adolescent depression is important for prevention and treatment.
- Peers have more pronounced impact during adolescence.

### ○ Research Question

- How does peers' genetic predisposition to depression affect own mental health?
- What are the mechanisms underlying the effects?

### ○ What I Do

- Estimate short- and long-term effects of peers' genetic predisposition to depression on own mental health using data from Add Health.
  - Exploit variation within schools and across grades in same-gender grademates' avg. polygenic score for major depressive disorder (MDD).
- Explore pathways through which peers' genetic risk impacts own mental health.

### ○ Contribution

- This research adds to the literature of...
  - ✓ *Peer effects on mental health*
    - Focus on the role of adolescent peers in the US context.
    - Focus on peers' genetic risk for depression.
    - Identify immediate effects of adolescent peers on own depression.
    - Explore a wider range of potential mechanisms.
  - ✓ *Social-genetic effects in the context of mental health*
    - My findings suggest a genetic foundation for social contagion of adolescent mental health in clinical/medical studies.

## Data

### ○ National Longitudinal Study of Adolescent to Adult Health (Add Health)

- Nationally representative sample of adolescents in grades 7-12 in the US during 1994-95 school year.
- Use **Wave I** to measure short-term effects and **Wave IV** to measure long-term effects.

### ○ Genetic data in Add Health

- Collected for Wave IV respondents who provided saliva for genetic testing (~9,000 people).
- Use polygenic score for major depressive disorder (*the MDD score*).
  - ✓ Higher the score, the more likely one experiences depression.
- Use **same-gender grademates' average MDD score** to measure peers' genetic predisposition to depression.
- 2,335 females and 1,682 males from 91 schools in analysis sample.

## Empirical Strategy

$$Y_{isgw} = \beta_0 + \beta_1 \overline{PGS}_{-isgI} + \beta_2 PGS_{isg} + \alpha_0 X_{isgI} + \alpha_1 G_{sgI} + \rho_s + \delta_g + \varepsilon_{isgw}$$

- $Y_{isgw}$  is outcome of student  $i$  at school  $s$  and grade  $g$  in wave  $w$ .
- $\overline{PGS}_{-isgI}$  is average MDD score of same-gender grademates (excluding student  $i$ ) attending the same grade  $g$  and school  $s$  of student  $i$  in Wave I.
- Circumvent **three main challenges**...
  - Reflection problem, endogenous peer group formation, and common environments.

## Findings

### ○ Main Results

- 1 SD ↑ in peers' avg. genetic risk for depression during adolescence → ↑ likelihood of depression:
  - ✓ by 2.3 ppt for adolescent girls, an 8.7% ↑.
  - ✓ by 3 ppt for adolescent boys, a 20% ↑.
- Effects persist into adulthood only for females.
  - ✓ 2.9 ppt ↑ in likelihood of depression in adulthood, a 14% ↑.

### ○ Mechanisms

- Especially for females, exposure to peers in adolescence w/ increased genetic risk for depression:
  - ✓ Worsens friendship/socialization in adolescence and adulthood.
  - ✓ Increases substance use in adolescence and adulthood.
  - ✓ Decreases socioeconomic status in adulthood.

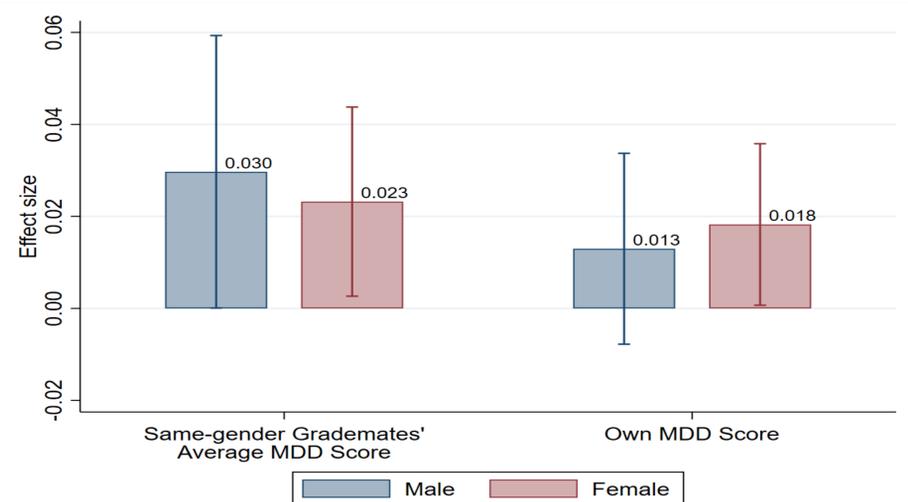


Figure 1. Short-term effects on probability of being depressed

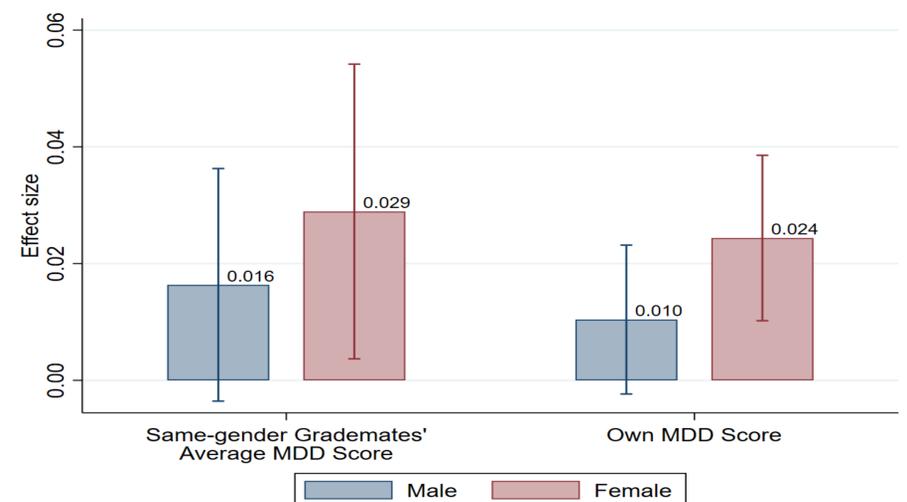


Figure 2. Long-term effects on probability of being depressed

## Discussion and Conclusions

### ○ Implication

- Genes are important part of social environment.
  - ✓ Efforts to prevent and treat depression can be more effective by taking genetic aspects into account.

### ○ Future work

- Explore...
  - ✓ Additional channels (e.g., academic performance and delinquency)
  - ✓ Circumstances or environments that mitigate the effects (e.g., childhood SES or relationships with parents)

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