Can Mentoring Alleviate Family Disadvantage in Adolescence?

A Field Experiment to Improve Labor-Market Prospects

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https://www.svenres.com/presentation-mentoring.html (or by clicking on the button →) Short Video Summary

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Motivation

- Persistence of **inequality** across generations major concern worldwide
  (e.g., Black and Devereux 2011; Corak 2013; Autor 2014; Alvaredo et al. 2018)

  – Also in countries with extensive social welfare systems (high persistence in Germany)

  – Partly due to high dropout from apprenticeship (about 20% of low-SES have no professional qualification)

- Defining characteristic of children from disadvantaged backgrounds

  – Lack powerful **family support** that other children receive by "accident of birth" (Heckman 2008)

- Successful interventions compensate lacking support already **early** in life
  (Cunha et al. 2006; Almond et al. 2018; Garcia et al. 2020; Kosse et al. 2020)

  – **Later** interventions in schools and labor markets much less successful (Cunha et al. 2006)

- Little attention: later interventions providing personal support from other adults

  → **Mentoring programs:** goal to provide support that is absent in a disadvantaged family environment

- This Paper: Evaluate whether **mentoring** can improve **labor-market prospects** of disadvantaged **adolescents**

  – **RCT** of a nationwide German mentoring program

The Literature

- Mentoring as part of **comprehensive support programs**
  - Combined with financial incentives, academic tutoring, and additional educational services
    (Rodríguez-Planas 2012; Oreopoulos et al. 2017; Lavecchia et al. 2020; Heller et al. 2017)

- **Pure mentoring programs**
  - Mostly non-experimental (reviews: DuBois et al. 2002; Rhodes 2008; Eby et al. 2008; Rodríguez-Planas 2014)
  - Main exception: **Big Brothers Big Sisters Program** (evaluated for 9- to 16-year-olds)
    (Grossman and Tierney 1998); Herrera et al. 2011)
    - Not particularly aimed at improving labor-market prospects
  - Two recent mentoring studies in **elementary-school** contexts
    - Effects on prosociality (Kosse et al. 2020) and truancy (Guryan et al. 2020)

- **Tutoring programs**
  - Distinct: not about relationships, but instruction of academic content (review: Nickow et al. 2020)

The Mentoring Program

- "Rock Your Life!"
  - Founded by group of university students in 2008, > 7,000 mentoring relationships

- **One-to-one mentoring:** each adolescent gets one voluntary university student
  - Adolescents (14-year-olds) in lowest-track schools in disadvantaged neighborhoods
  - 1-2 years of mentoring relationship (last years in school)

- **Main objective:** prepare for successful **transition into professional life**
  - From lower-secondary school to **apprenticeship** or upper-secondary school

- Core of program: regular mentor-mentee **meetings**
  - Focused on career orientation, school assistance, and leisure activities
  - Topics discussed: school issues (66%), leisure activities (57%), future in general (57%), occupational and educational future in particular (50%), personal issues (49%)

The RCT

- Data collection in 10 locations in two cohorts (plus pilots) in 2015-2020

- Randomization relied on **local program oversubscription**
  - RCT did not alter any elements of program or recruitment
  - **Random treatment assignment** within each site and cohort

- **308 adolescents** in 10 city locations serving 19 schools in two cohorts

- Substantial effort invested to reach participants **one year after program start**
  - More than 100 person-trips to participating schools for data collection
  - →Recontact rate of **98.7%** (304 of 308 participants)

Measuring Labor-Market Prospects

- **3 outcome dimensions** highly predictive of adolescents' later labor-market success
  - Shown for German PIAAC data

1. Cognitive component: **Math grades** in school
   - Administrative data

2. Behavioral component: **Patience and social skills**
   - Patience
   - Social skills: index
     - Prosociality; Trust; Self-efficacy: trust in own skills and abilities

3. Volitional component: **Labor-market orientation**
   - Would like to do an apprenticeship after school
   - Know exactly which occupation to work in later in life

- Combined into one **index of labor-market prospects**
  - Equally weighted average of z-scores (Kling et al. 2007; Anderson 2008; Heller et al. 2017)

Identify Students with Low Socioeconomic Background

- Heterogeneous effects by **SES**
  - Low-SES: main target group of program
  - Higher-SES: potential of crowd-out other useful inputs

- Measuring SES: **books at home** (6 categories) (e.g., Schuetz et al. 2008)
  - **Low-SES:** ≤ 25 books at home (lowest 2 categories) = 47% of sample
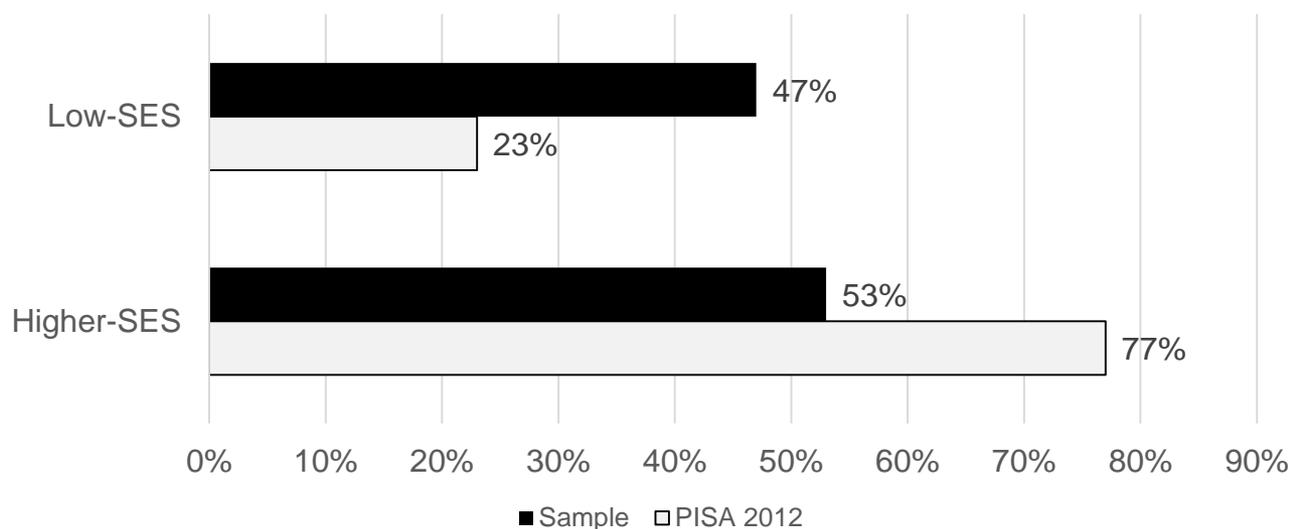
Effect of the Mentoring Program on Labor-Market Prospects
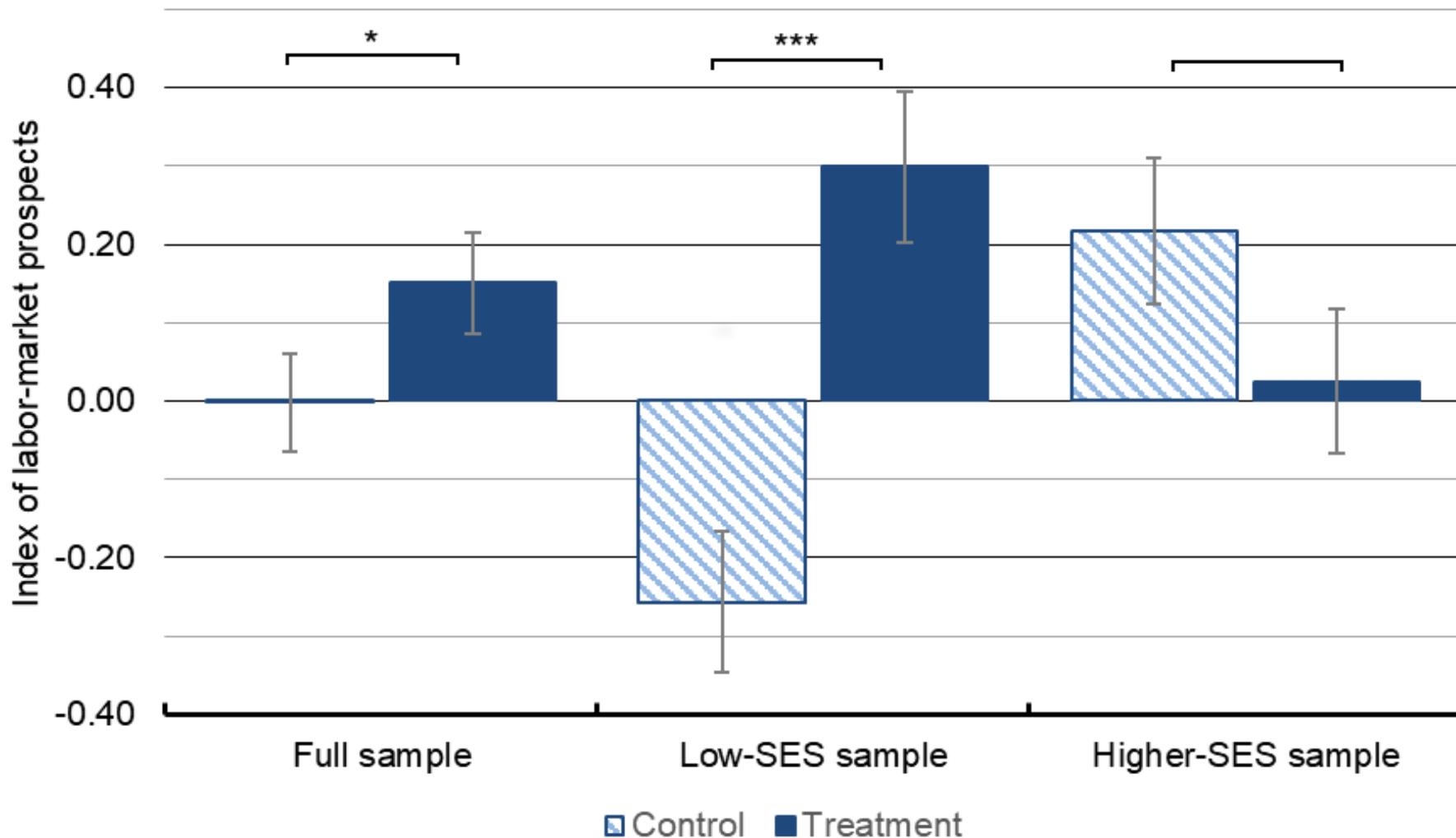
Notes: Figure shows the intention-to-treat effects (ITT) of the mentoring program on the index of labor-market prospects, separately for all respondents (left panel), low-SES respondents (those with at most 25 books at home at baseline) (middle panel), and higher-SES respondents (those with more than 25 books at home) (right panel). See specification in column 4 of Table 2 for details. The index of labor-market prospects is an equally weighted average of z-scores of three components: administrative math grade (reversed), patience and social skills index, and labor-market orientation index. Calculation of each z-score subtracts the score's control-group mean and divides by the control-group standard deviation. Error bars show robust standard errors. Significance levels of differences: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Effect of the Mentoring Program on Index of Labor-Market Prospects

	ITT				TOT
	(1)	(2)	(3)	(4)	(5)
Treatment	0.549***	0.573***	0.545***	0.556***	0.684***
	(0.180)	(0.144)	(0.136)	(0.143)	(0.170)
	[0.000]	[0.000]	[0.000]	[0.000]	–
Treatment x Higher-SES	-0.751***	-0.701***	-0.659***	-0.748***	-0.895***
	(0.237)	(0.197)	(0.209)	(0.220)	(0.251)
	[0.001]	[0.001]	[0.004]	[0.002]	–
Higher-SES	0.476***	0.431***	0.113	0.182	0.201
	(0.158)	(0.140)	(0.184)	(0.195)	(0.196)
Outcome in t_0		0.580***	0.501***	0.459***	0.439***
		(0.053)	(0.065)	(0.078)	(0.078)
Randomization-pair fixed effects	No	No	Yes	Yes	Yes
Covariates	No	No	No	Yes	Yes
Observations	304	304	304	304	304
R^2	0.040	0.325	0.723	0.753	0.754
Kleibergen-Paap F statistic					141.50
Treatment effect for Higher-SES	-0.202	-0.128	-0.114	-0.192	-0.211
	(0.154)	(0.135)	(0.137)	(0.137)	(0.151)
SES gap			0.476		

Notes: Table shows intention-to-treat (ITT) effects and treatment-on-treated (TOT) effects of the mentoring program on the index of labor-market prospects. The index is an equally weighted average of z-scores of three components: administrative math grade (reversed), patience and social skills index, and labor-market orientation index. Calculation of each z-score subtracts the score's control-group mean and divides by the control-group standard deviation. Columns 1-4: ordinary least squares estimates; column 5: two-stage least squares estimates. In the TOT estimation in column 5, *Treatment* indicates program take-up (one if mentor and mentee have met at least once, zero otherwise), which is instrumented by the random treatment assignment. *SES gap* is calculated as the coefficient on higher-SES background in a regression of the outcome on the higher-SES indicator in the control-group sample in the follow-up survey (see column 1). Covariates are from the baseline survey and include: gender, age, migrant, received paid private teaching, parental homework support, and Big-5 personality traits. Dummies for missing values in t_0 are included. Robust standard errors in parentheses. Randomization inference (RI) p-values in square brackets, obtained from RI with 1,000 permutations, assigning the treatment status randomly within randomization pairs. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Effect of the Mentoring Program on Math Achievement

	Math grade	Dummies of specific math grades			
		"very good"	"good" or better	"satisfied" or better	"pass" or better
	(1)	(2)	(3)	(4)	(5)
Treatment	0.294** (0.142) [0.034]	0.129* (0.076) [0.103]	0.150* (0.083) [0.088]	0.153** (0.073) [0.035]	0.042 (0.057) [0.498]
Treatment x Higher-SES	-0.467** (0.230) [0.036]	-0.222* (0.119) [0.061]	-0.263* (0.139) [0.057]	-0.136 (0.121) [0.217]	-0.051 (0.076) [0.516]
Higher-SES	0.283 (0.196)	0.168* (0.095)	0.156 (0.101)	0.094 (0.104)	-0.014 (0.070)
Outcome in t_0	0.488*** (0.100)	0.580*** (0.125)	0.371*** (0.114)	0.261** (0.127)	0.135 (0.168)
Randomization-pair fixed effects	Yes	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes	Yes
Observations	294	294	294	294	294
R^2	0.775	0.653	0.694	0.697	0.680
Treatment effect for Higher-SES	-0.172 (0.145)	-0.093 (0.071)	-0.113 (0.089)	0.017 (0.080)	-0.010 (0.042)
SES gap	0.553	0.222	0.217	0.211	0.080
Control-group mean in follow-up	0.000	0.195	0.432	0.608	0.865

Notes: Table shows ITT effects of the mentoring program on administrative math grades. Column 1: grades are standardized by subtracting the control-group mean and dividing by the control-group standard deviation; order of grades is reversed so that higher values indicate better outcomes. Columns 2-5: dummies indicating achievement of at least the specified grade. Ordinary least squares estimates. *SES gap* is calculated as the coefficient on higher-SES background in a regression of the respective outcome on the higher-SES indicator in the control-group sample in the follow-up survey. *Control-group mean* indicates the mean of the respective outcome in the control-group sample in the follow-up survey. Covariates are from the baseline survey and include: gender, age, migrant, received paid private teaching, parental homework support, and Big-5 personality traits. Dummies for missing values in t_0 are included. Robust standard errors in parentheses. Randomization inference (RI) *p*-values in square brackets, obtained from RI with 1,000 permutations, assigning the treatment status randomly within randomization pairs. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Effect of the Mentoring Program on Patience and Social Skills

	Patience and social skills	Patience	Social skills			
	Index	Index	Index	Components		
				Prosociality	Trust	Self-efficacy
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.439***	0.441**	0.217	0.179	0.095	0.151
	(0.152)	(0.175)	(0.177)	(0.181)	(0.211)	(0.181)
	[0.003]	[0.019]	[0.240]	[0.310]	[0.628]	[0.408]
Treatment x Higher-SES	-0.587**	-0.536*	-0.321	-0.296	-0.082	-0.285
	(0.255)	(0.279)	(0.240)	(0.266)	(0.288)	(0.250)
	[0.018]	[0.061]	[0.207]	[0.273]	[0.780]	[0.266]
Higher-SES	0.164	0.181	0.070	0.151	-0.187	0.119
	(0.227)	(0.226)	(0.224)	(0.212)	(0.270)	(0.224)
Outcome in t_0	0.261**	0.262***	0.459***	0.419***	0.373***	0.447***
	(0.103)	(0.086)	(0.117)	(0.126)	(0.112)	(0.094)
Randomization-pair fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Observations	291	291	291	290	290	291
R^2	0.695	0.648	0.701	0.730	0.601	0.679
Treatment effect for Higher-SES	-0.148	-0.095	-0.104	-0.118	0.013	-0.134
	(0.174)	(0.181)	(0.140)	(0.161)	(0.166)	(0.142)
SES gap	0.389	0.270	0.320	0.254	0.077	0.313

Notes: Table shows ITT effects of the mentoring program on patience and social skills. Variables and indices are standardized by subtracting the control-group mean and dividing by the control-group standard deviation. Ordinary least squares estimates. *SES gap* is calculated as the coefficient on higher-SES background in a regression of the respective outcome on the higher-SES indicator in the control-group sample in the follow-up survey. Covariates are from the baseline survey and include: gender, age, migrant, received paid private teaching, parental homework support, and Big-5 personality traits. Dummies for missing values in t_0 are included. Robust standard errors in parentheses. Randomization inference (RI) *p*-values in square brackets, obtained from RI with 1,000 permutations, assigning the treatment status randomly within randomization pairs. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Effect of the Mentoring Program on Labor-Market Orientation

	Index	Wants apprenticeship after school	Knows future career
	(1)	(2)	(3)
Treatment	0.291* (0.167) [0.066]	0.216*** (0.083) [0.019]	0.007 (0.162) [0.968]
Treatment x Higher-SES	-0.299 (0.275) [0.268]	-0.280** (0.137) [0.041]	0.105 (0.269) [0.684]
Higher-SES	-0.086 (0.220)	0.116 (0.109)	-0.350 (0.223)
Outcome in t_0	0.382*** (0.089)	0.490*** (0.084)	0.319*** (0.081)
Randomization-pair fixed effects	Yes	Yes	Yes
Covariates	Yes	Yes	Yes
Observations	291	290	291
R^2	0.696	0.667	0.693
Treatment effect for Higher-SES	-0.008 (0.173)	-0.065 (0.091)	0.111 (0.169)
SES gap	-0.077	-0.031	-0.059
Control-group mean in follow-up	0.000	0.444	0.000

Notes: Table shows ITT effects of the mentoring program on labor-market orientation. Variables and indices are standardized by subtracting the control-group mean and dividing by the control-group standard deviation. Ordinary least squares estimates. *SES gap* is calculated as the coefficient on higher-SES background in a regression of the respective outcome on the higher-SES indicator in the control-group sample in the follow-up survey. *Control-group mean* indicates the mean of the respective outcome in the control-group sample in the follow-up survey. Covariates are from the baseline survey and include: gender, age, migrant, received paid private teaching, parental homework support, and Big-5 personality traits. Dummies for missing values in t_0 are included. Robust standard errors in parentheses. Randomization inference (RI) *p*-values in square brackets, obtained from RI with 1,000 permutations, assigning the treatment status randomly within randomization pairs. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Additional Results

- Additional analysis of **effect heterogeneity**
  - By migrant status (58% adolescents with migrant background)

- Tests for **spillover** effects on non-participating peers
  - No effect heterogeneity by number of treated adolescents in school or class

- **Robustness**
  - Broader SES index,index of labor-market orientation
  - Leave-one-site-out estimation; Site-specific (low-SES) treatment effects: positive for *each* individual site

Analysis of mechanisms:
Share of Low-SES Treatment Effect Attributed to Mediators

Panel A: Index of labor-market prospects

All channels combined | 4% | 25% | 5% | 66%

0%   20%   40%   60%   80%   100%

Panel B: Components

Math achievement in school | 37% | 10% | 53%

Patience and social skills | 12% | 43% | 45%

Labor-market orientation | 2% | 29% | 69%

0%   20%   40%   60%   80%   100%

Legend:
- Perceive school as useful for job
- Talk with mentor about future
- Mentor important for job choice
- Other factors
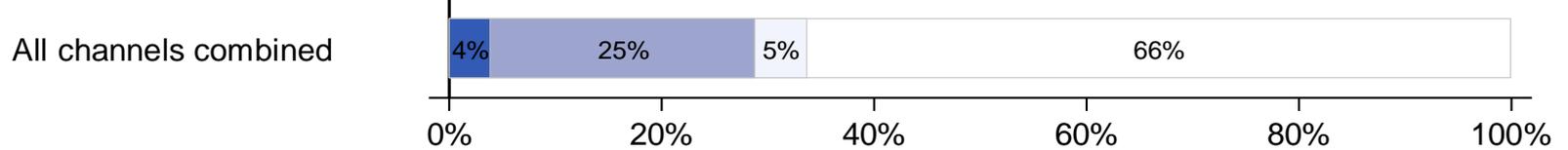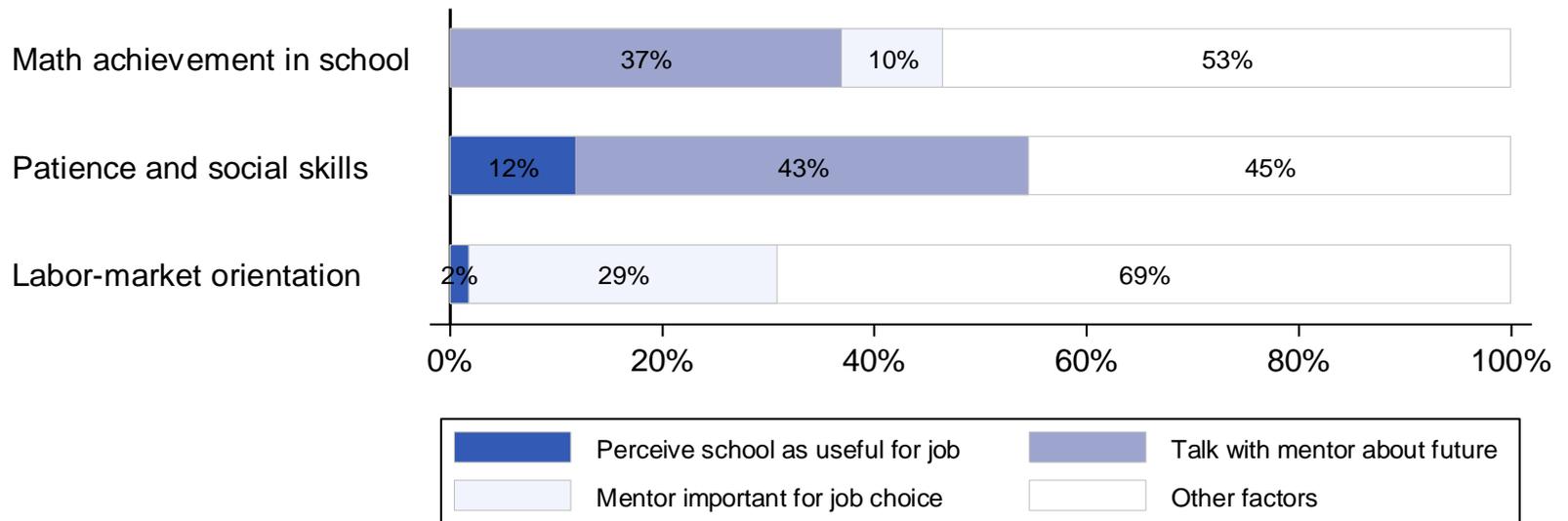
Notes: Figure shows the share of the intention-to-treat effects (ITT) on the index of labor-market prospects (panel A) and on its three components (panel B) in the low-SES sample attributed to the respective mediator in a mediation analysis. Panel B includes all channels combined (mediators with insignificant negative contributions excluded). See Appendix G in the paper for details.

Conclusions

- **Labor-market prospects** of highly **disadvantaged youths** are malleable
  - Apparently, mentors able to substitute for some elements of parental support that many disadvantaged youths are lacking

- Program not effective for **higher-SES** adolescents
  - Program participation may even crowd out social school activities and parental attachment

- **Benefit-cost ratio** (projected lifetime labor-market returns to better school grades)
  - 15-to-1 for untargeted program

- **Scalability** of successful mentoring programs
  - Strong heterogeneity by SES → importance of **targeting** those who lack family support
  - Nationwide franchise grew from 1 to over 40 sites, RCT not focused on selected sites → scalability **beyond one specific location** (but restricted to cities with universities)

Thank you for your attention!

(An audio file companion for the presentation is available on the ATIV conference platform)

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