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DISCUSSION PAPER SERIES

IZA DP No. 17446

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ABSTRACT

Gritty Peers*

We use the National Longitudinal Study of Adolescent to Adult Health to explore how high school peers' grit, a personality trait characterized by perseverance and passion, influences long-term outcomes. Exploiting random variation within schools across cohorts, we find that peer grit significantly increases future earnings, especially for students from disadvantaged backgrounds. We identify two key mechanisms: an increased likelihood of employment in jobs aligned with career goals and a reduced probability of feeling overwhelmed by difficulties. Additionally, peer grit leads to higher job satisfaction and asset accumulation. Thus, peer grit's effects extend beyond short-term educational performance and persist into adulthood.

JEL Classification: I24, J13, J24

Keywords: grit, peer effects, long-term outcomes, Add Health

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1 Introduction

A growing literature in economics, psychology, and sociology has recognized the importance of personality traits in explaining individuals' life trajectories. Traits such as patience, conscientiousness, self-control, and grit have been shown to be highly predictive of outcomes including educational attainment, health, risky behaviors, earnings, and investment (e.g., Duckworth et al., 2007; Borghans et al., 2008; Duckworth and Quinn, 2009; Almlund et al., 2011; Golsteyn et al., 2014; Lam and Zhou, 2022; Santos et al., 2022; Savelyev, 2022). Additionally, research on peer effects during childhood and adolescence has demonstrated that peer characteristics such as race, gender, behaviors, and test scores influence long-term outcomes including earnings realized during adulthood (e.g., Burke and Sass, 2013; Carrell et al., 2018; Lépine and Estevan, 2021; Feld and Zölitz, 2022; Denning et al., 2023). However, there is little evidence on the labor market consequences of high-school peers' personality traits, specifically, how peers' grit—as distinct from an individual's own grit—can shape one's own long-term outcomes. From a policy standpoint, this question is particularly relevant, as understanding peer effects is crucial for identifying social spillovers and comprehensively evaluating educational interventions.

In this paper, we examine whether peer personality affects long-run labor earnings, using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health)—a longitudinal study of a nationally representative sample of adolescent students in the United States, which provides extensive information on personality traits and long-run outcomes. Tracking individuals from high school into adulthood is challenging, which may explain why most existing literature emphasizes the influence of peer personality traits on short-term educational outcomes. However, the question of whether these peer effects extend beyond academic performance and persist into adulthood—especially in shaping economic outcomes like earnings—remains largely unexplored. Our study fills this gap by examining whether peer personality traits during adolescence have a lasting impact on labor market outcomes in early adulthood.

We focus on one key personality trait: grit, which is characterized by perseverance and passion toward a specific goal. Own grit has been proven to be associated with

improved educational attainment and economic success (Duckworth et al., 2007; Duckworth and Quinn, 2009; Alan et al., 2019). Additionally, peer persistence—an important facet of grit—has also been shown to boost educational performance (Golsteyn et al., 2021; Shure, 2021; Zou, 2024) but mainly in the short-run. Building on these insights, we investigate whether peer grit during high school (ages 12-19) affects *long-run* outcomes in early adulthood (ages 24-32) and their persistence into mid-adulthood (ages 34-43), conditional on educational attainment. We leverage random variation in peer grit across cohorts within schools, while controlling for school and cohort fixed effects. Following the procedure proposed by Guryan et al. (2009), we find no evidence of sorting into school-cohorts based on grit, conditional on the leave-out means at school level and predetermined characteristics at both the individual and family level. By focusing on peers within the same cohort rather than classmates or nominated friends, we address concerns related to the endogenous formation of peer groups, as discussed in the literature (McPherson et al., 2001; Belot and de Ven, 2011; Graham, 2015). Moreover, by conditioning on average peer individual and family characteristics we can isolate the specific impact of peer grit. This approach allows us to ensure that our findings are not confounded by other peer characteristics, such as their socioeconomic status or family background.

Our findings reveal a sizable effect of peer grit on annual gross earnings: a one standard deviation increase in peer grit is associated with a 3.9% increase in earnings. This effect is sizable when compared to the impact of one's own grit (6.2%). Students from economically disadvantaged backgrounds, as defined by parental income or education, benefit more from peer grit. Additionally, individuals who were more exposed to peers with higher grit during high school tend to experience greater job satisfaction, and are more likely to hold jobs aligned with their long-term career goals. They also accumulate more assets in early adulthood. However, we do not find a significant impact of peer grit on labor supply or specific job characteristics, such as holding a supervisory role, working in non-repetitive tasks, or engaging in decision-making roles at work.

Our further analysis reveals that peer grit influences personality and attitudes in

both the short and long run. Individuals who had gritty peers during high school reported higher levels of their own grit in the follow-up survey one year later. In the long run (14-15 years after), they also exhibit lower risk aversion and less frequent feelings of being unable to overcome recent difficulties in their lives. These factors may contribute to their economic success. Indeed, we find that the long-term effects on earnings we identify can be partly explained by the impact of peer grit on increasing an individual's own grit after one year. Moreover, two additional factors appear to mediate the relationship between high school peers' grit and an individual's earnings in adulthood: a greater likelihood of perceiving one's current job as a preparation for long-term career goals, and a decreased likelihood of feeling overwhelmed by difficulties. We do not find clear evidence that the average grit of high school peers affects any of the Big Five personality traits, namely openness, conscientiousness, extraversion, agreeableness, or neuroticism.

Our research contributes to the literature that investigates the effects of peer characteristics on students' academic and life outcomes (e.g., Zimmerman, 2003; Aizer, 2009; Black et al., 2013; Antecol et al., 2016). In particular, we focus on the importance of peer *personality*. Previous studies have explored the effects of peer motivation (Bietenbeck, 2024), disruptive behavior (Carrell et al., 2018), creativity (Van Lent, 2024), and the Big Five personality traits (Shure, 2021; Hancock and Hill, 2022) in the short run. The closest strand of research studies the effect of persistent peers, finding that peers with high levels of persistence are associated with improved short-term educational outcomes for students (Golsteyn et al., 2021; Shure, 2021; Zou, 2024). Our analysis confirms this, indicating that peer grit improves high school Math grades and increases the likelihood of college enrollment. Due to the difficulty of tracking individuals into adulthood, however, little is known about how peer grit affects long-run outcomes. By utilizing the unique features of the Add Health survey, which tracks individuals from high school into adulthood, we fill this gap and provide the first empirical evidence that high school peers' personality traits also influence long-term economic success in adulthood.

Our second contribution is to the literature on the role of peer characteristics in shaping the development of individual personality traits (Gong et al., 2021; Pagani et al.,

2021; Xu et al., 2022). In particular, Shan and Zölitz (2022) show that having conscientious peers can increase students' own conscientiousness, with effects lasting for at least three years. We extend this by demonstrating that peer grit influences short-run own grit but also risk aversion in the long run (after 14-15 years). These long-lasting effects suggest that peer grit may influence personality beyond mere peer observation—a widely discussed potential mechanism (e.g., Buechel et al., 2018; Gerhards and Gravert, 2020)—as individuals' actions are less likely to be observed by their high school peers once they reach adulthood.

Our findings establish a link between the peer effects literature and empirical evidence on the importance of individual grit. We demonstrate that, in addition to factors like ability, gender, and race of peers, peer grit also plays a crucial role in long-term outcomes such as earnings. It is not only an individual's own grit that matters for long-run outcomes; peer grit is also important. Seminal papers highlight the positive impact of early childhood programs and classroom training designed to boost individual personality traits on educational and economic success (e.g., Yeager and Dweck, 2012; Heckman et al., 2013; Sisk et al., 2018; Alan and Ertac, 2018, 2019; Alan et al., 2019; Sorrenti et al., 2024). Our results imply that the social returns of such interventions may be underestimated if the spillover effects of peer grit are overlooked, particularly regarding long-term outcomes like earnings.

2 Data

We use data from Add Health, a longitudinal survey of a nationally representative sample of high school students in the United States. During the 1994-1995 school year, a selection of 80 high schools and 52 middle schools participated, with over 90,000 students from grades 7 through 12 completing an in-school survey. Approximately 20,000 of these students were then invited for in-home interviews, with data collection continuing over five additional waves. Add Health collected comprehensive information on a wide range of topics, including demographic characteristics, social relationships, family and socioeconomic background, health and behavioral issues, academic performance, personality traits, and labor market outcomes.

In our analysis, we mainly focus on in-home interview data from 1994-1995 (Wave I), when respondents were aged 12 to 19; follow-up data from one year later (Wave II); data from 2001-2002 (Wave III), when participants were aged 18 to 25 and had typically completed high school; and data from 2009 (Wave IV), when participants were aged 24 to 32.[1]

Our measure of grit is constructed by selecting questions from the Wave I survey that closely align with the Short Grit Scale introduced and validated by Duckworth and Quinn (2009) as the Add Health data does not include a direct measure of grit.[2] Based on the responses to these questions, we use factor analysis to construct a single "grit" variable.[3] Factor analysis helps identify or confirm the latent factor structure among a group of measured variables (Harman, 1967). Latent factors are unobserved variables that cannot be directly measured but are assumed to influence observed outcomes. In this context, the latent factor is "grit", which is presumed to influence individuals' responses to certain questions in the Add Health survey. Online Appendix A presents a detailed description of the factor analysis used in this study.[4] Our variable of interest, peer grit, is constructed at the school-cohort level using the Add Health school and grade identifiers. Specifically, for each respondent, we calculate the leave-out-mean of grit among their peers in the same school and grade, excluding the respondent.[5]

Add Health includes information on other personality traits potentially related to grit, such as self-control, self-confidence, and depression. In our sensitivity analysis, by controlling for these factors (both for the individuals and their peers), we ensure that our grit measure does not capture their effects (see Section 4).

[1] In our further analysis, we also utilize data from 2016-2018 (Wave V), when the respondents were aged 34-43 (see Section 4).

[2] We use the following questions from Add Health to construct the grit measure: (1) You had trouble keeping your mind on what you were doing; (2) Difficult problems make you very upset; (3) When you get what you want, it's usually because you worked hard for it; (4) It was hard to get started doing things; (5) You felt that you were too tired to do things; (6) You usually go out of your way to avoid having to deal with problems in your life; and (7) You feel like you are doing everything just about right. See, for details on the Short Grit Scale, Duckworth and Quinn (2009).

[3] For a similar approach, see Fernández-Villaverde et al. (2014) who construct a "shame" factor using Add Health data.

[4] To provide evidence of comparability between our measure of grit and other personality traits commonly used in the literature, we follow Golsteyn et al. (2021) and calculate the correlation between our measure of grit and conscientiousness. Data on conscientiousness comes from Add Health Wave IV, the only wave that includes constructed measures of the Big Five personality traits. We find that our grit measure is correlated with conscientiousness (see Section 4).

[5] For respondents with fewer than three peers within their school-grade, we treat cohort-level variables as missing.

We examine the effects of peer grit on respondent's long-term outcomes using several (self-reported) measures from Wave IV including annual gross earnings (in US dollars), total value of assets (categorized from 1 less than $5,000 to 9 for $1,000,000 or more), labor supply (measured as the probability of being non-employed and the probability of working at least 10 hours a week), occupation characteristics (such as having a supervisory role, performing non-repetitive tasks, and having freedom in decision making at work), job satisfaction (categorized from 1 for extremely dissatisfied to 5 for extremely satisfied), whether the respondent describes their primary job as part of their long-term career or work goals, and how often the respondent felt overwhelmed by difficulties (ranging from 0 for very often to 4 for never).[6,7] Following the literature, we also consider outcomes related to academic performance, such as high school Math grades from Wave I and college enrollment from Wave III. In our analysis we also consider personality traits and attitudes measured in Wave IV, including risk aversion, and Big Five Personality traits (Extraversion, Neuroticism, Agreeableness, Conscientiousness, Openness). Additionally, we construct a grit measure in Wave II using the same method (factor analysis) and the same set of questions as in Wave I.[8] Online Appendix Table B1 provides further details for all the variables included in our analysis.

Table 1 reports the summary statistics of our sample.[9] For this sample, both own grit and peer grit show considerable variation, but the latter is less volatile (i.e., has a lower standard deviation).[10] According to Appendix Figure A1 (a), most individuals have a grit score around -1 to 1, but there is also a non-negligible number of students with low scores.[11] Approximately 51% of the sample are males, with ages ranging from 24 to 32.

[6]We use the question from Wave IV, 'In the last 30 days, how often have you felt that difficulties were piling up so high that you could not overcome them?' to construct the variable related to feelings about difficulties. We recode the variable so higher values correspond to a lower frequency of experiencing difficulties.

[7]The Add Health data set does not provide continuous information on hours of work.

[8]Note that the questions used to construct the grit measures in Waves I and II were not asked again in the subsequent waves.

[9]In Wave IV, we observe a total of 6,307 individuals. After trimming the bottom and top 1% of positive earnings, our main sample consists of 5,772 observations.

[10]In Section 3, we formally demonstrate that there is sufficient variation at the level of identification—that is, within schools across cohorts.

[11]The distribution of our grit measure after accounting for baseline covariates displays a pronounced left tail (see Appendix Figure A1 (b)), similarly to the distribution of the residuals of the grit measure in Alan et al. (2019) (see their Figure III, sample 2).

The table also includes summary statistics for other potential determinants of earnings, such as race, highest level of education, high school Add Health Picture Vocabulary Test (AHPVT) standardized test score (as an ability proxy), birthplace (whether the respondent was born in the United States), parental education, parental income, number of siblings, first-born status within the family, and whether the respondent was living with both parents during Wave I, as well as outcomes of interest considered in the subsequent empirical analysis.[12]

[Table 1 here]

3 Empirical Strategy

To estimate the impact of peer grit on long-term outcomes, we utilize the unique design of the Add Health survey, which tracks multiple cohorts within the same school. Our approach leverages differences in the distribution of grit among peers across cohorts, assuming that families select schools based on general information about the average student composition in the school rather than the specific composition of their child's cohort (which is in principle not known, making cohort-based sorting unlikely). This approach is widely used in the literature (Hoxby, 2000; Bifulco et al., 2011; Lavy and Schlosser, 2011; Cools et al., 2022; Merlino et al., 2024; Kiessling and Norris, 2023; Adamopoulou and Kaya, 2024).

The success of our identification strategy relies on two factors. First, we need sufficient variation within schools across cohorts to obtain precise estimates. Following Ammermueller and Pischke (2009), we perform a variance decomposition by first calculating the school-cohort average of our grit measure. We then decompose the total variance in the school-cohort average into within-school and between-school components.[13] Results shown in Appendix Table A1 confirm that there is reasonable

[12] A parent or guardian was interviewed during Wave I, providing further information about family characteristics, including the highest level of education attained and the gross total family income. More than 90.5% of the parent interview respondents were mothers (biological, step, adoptive, or foster).

[13] Formally, the total variance in school-cohort average of variable x is decomposed into its within and between school components using the relationship: $\frac{1}{C}\sum_{s=1}^{S}\sum_{c=1}^{C_s}(x_{cs}-\bar{x})^2 = \frac{1}{C}\sum_{s=1}^{S}\sum_{c=1}^{C_s}(x_{cs}-\bar{x}_s)^2 + \frac{1}{C}\sum_{s=1}^{S}C_s(\bar{x}_s-\bar{x})^2$, where $s = 1, 2, ..., S$ and $c = 1, 2, ..., C_s$ denote school and school-cohort indicators, respectively, and C is the total number of cohorts in the sample.

variation within, between, and overall across cohorts.

Second, the assumption that students are randomly assigned to cohorts within schools needs to be credible. By defining the peer group based on all students in a given cohort, rather than friendship nominations, we mitigate potential concerns regarding "homophily"—the tendency of individuals to select friends similar to themselves (McPherson et al., 2001; Belot and de Ven, 2011; Graham, 2015). Furthermore, we formally test for sorting in our setting using the correction method proposed by Guryan et al. (2009). Specifically, we regress peer grit (leave-out-mean at the cohort-school level) on the individual's own grit, conditional on the leave-out mean at the school level, as well as school and cohort fixed effects. We then include predetermined characteristics as additional controls. As the Appendix Table A2 shows, there is no evidence of sorting based on grit. The coefficient estimate for own grit is negligible and not statistically significant, regardless of whether we control for other predetermined characteristics. This confirms that the composition of peer groups based on grit is effectively random. Additionally, the coefficient estimates for the predetermined characteristics are not jointly statistically significant, as indicated by the p-value of the F-test presented in the last row of column 2. The lack of a significant relationship between an individual's grit and the average grit of their peers (as well as the absence of statistically significant effects for other predetermined characteristics) suggests that peer group formation is not influenced by sorting mechanisms that align students with similar traits. Thus, we can interpret the observed peer effects in our study as not being confounded by intentional or unintentional sorting based on grit, reinforcing the validity of our approach.

Our baseline specification applies the linear-in-means (LIM) peer effects model as follows:

$$\text{Outcome}_{ics} = \beta_0 + \beta_1 \text{grit}_{ics} + \beta_2 (\text{peer grit})_{-ics} + \beta_3 X_{ics} + \eta_c + \kappa_s + u_{ics} \qquad (1)$$

where $Outcome_{ics}$ of individual i within grade (i.e., cohort) c and school s, representing the (log) annual gross earnings in Wave IV in our baseline, is regressed on individual's i own grit and the average peer grit within the same school and grade excluding the individual i (i.e., leave-out-means denoted by subindex $-i$), grade (i.e., cohort) fixed

effects η_c, and school fixed effects κ_s. The benchmark specification also includes a set of observable characteristics X_{ics} that are potential determinants of earnings such as gender, age, race, whether the respondent was born in the United States, the highest level of education, AHPVT standardized test score, parental education and income, number of siblings, whether the respondent is the first-born child, and whether the respondent was living with both parents in Wave I.[14] Our primary outcome of interest is earnings but we also examine the effects on short-term outcomes related to academic performance and individual grit, as well as long-term outcomes associated with job characteristics and personality traits. In our benchmark models, we cluster standard errors clustered at the school level; however, we also conduct sensitivity analyses using clustering at the grade level and the school$\times$grade level (see Section 4).

4 Results

4.1 Short-term outcomes

Before we turn our attention to long-run outcomes, we start our empirical analysis by estimating a version of equation 1 to explore whether peer grit impacts students' short-run outcomes, particularly related to their academic performance (grades and college enrollment as reported in Waves I and III, respectively).[15] This allows us to examine whether we observe similar patterns in our sample as those reported in previous literature (Duckworth et al., 2007; Duckworth and Quinn, 2009; Alan et al., 2019; Golsteyn et al., 2021; Santos et al., 2022; Zou, 2024). Table 2 displays these results. We find that own grit is associated with higher grades across all subjects (Columns 1-4), high school GPA (Column 5) as well as an increased probability of enrolling in college (Column 6), consistent with findings in the literature.

Our findings further reveal that peer grit is also important. Specifically, peer grit improves high school Math grades (Column 1) and the likelihood of college enrollment

[14] In robustness checks, we expand the set of control variables to include both individual and peer measures of self-control, confidence, physical attractiveness, self-perceived health, the Big Five personality traits, and depression, along with cohort size and the average characteristics of peers (see Section 4).

[15] Given the outcomes of interest, the set of control variables in these models includes all those mentioned in Section 3, except the highest level of education.

(Column 6). A one standard deviation increase in peer grit increases the probability of college enrollment by 2.8 percentage points. This effect is sizable as one standard deviation increase in own grit is associated with a 3.3 percentage points higher likelihood of college enrollment. However, we find no evidence that peer grit affects high school grades in other core subjects such as Science (Column 2), English (Column 3), and History (Column 4), or overall GPA (Column 5).

Our finding that peer grit improves high school Math grades aligns with findings from Golsteyn et al. (2021), Shure (2021), and Zou (2024), who also exploit random allocation of peer groups and demonstrate that peer persistence, a facet of grit, positively affects student performance across different countries and age groups.[16] Moreover, we extend the insights from Zou (2024), who document that peer grit correlates with higher self-reported aspirations for obtaining a college degree. The results presented in Table 2 demonstrate that students exposed to higher peer grit also have a greater probability of actually enrolling in college.

One possible channel through which peer grit improves short-term educational outcomes could be by increasing an individual's own grit. Table 2 Column 7 examines this by assessing the impact of peer grit on an individual's own grit measured one year later (in Wave II), and confirms that this is indeed the case. A one standard deviation increase in peer grit increases own grit one year later by 4.2%. This finding is consistent with the results of Shan and Zölitz (2022), who focus on conscientiousness rather than grit and find that peer conscientiousness can enhance an individual's own conscientiousness for at least three years, based on a field experiment involving undergraduate students. Our findings indicate that the effect of peer personality traits on the development of one's own traits starts already during adolescence, that is, among high school students.

[Table 2 here]

[16] Golsteyn et al. (2021) study the impact of peer persistence on student academic performance using data from a Dutch business school. Shure (2021) uses data from Flanders, Belgium, focusing on pupils who began secondary school in 1990. Zou (2024) analyzes data from Chinese middle school students from grades 7 and 8.

4.2 Earnings

We now turn our attention to the effects of peer grit on long-term outcomes, particularly earnings (reported in Wave IV).[17] Table 3 shows that own grit during high school is positively and significantly associated with (log) annual gross earnings when individuals are aged between 24 and 32 (Column 1). A one standard deviation increase in own grit is associated with a 6.2% increase in earnings. This is similar to the findings of Fletcher (2013), who reports that a one standard deviation increase in conscientiousness results in a 3-6% increase in earnings.

Turning to the role of peer grit–which is the main focus of our paper–Table 3 shows a strong, positive, causal effect of the average grit of high school peers on earnings. A one standard deviation increase in peer grit is associated with a 3.9% increase in earnings. This effect is substantial when compared to the impact of one's own grit (6.2%), educational attainment (9.2%), or gross household income during high school (4.8%).[18] Therefore, it is not only an individual's own grit but also the grit of their peers that can positively influence long-term economic success in the labor market.

As emphasized by seminal research, considering heterogeneity in family background is crucial (e.g., Papageorge and Thom, 2020; Bolyard and Savelyev, 2024). Socioeconomic factors affect access to resources and opportunities. Students from higher-income or more educated households may benefit from environments that already foster traits like resilience and persistence, meaning that the additional influence of peer grit could be less pronounced. Conversely, for students from lower-income or less educated backgrounds, exposure to high-grit peers may play an important role in shaping their long-term outcomes. The following columns of Table 3 examine whether the impact of peer grit varies by students' socioeconomic background, specifically parental education and income. In particular, we categorize students based on their parents' education and income levels as having low-educated, high-educated, low-income, or high-income

[17] This information come from the Add Health question: "In 2006/2007/2008, how much income did you receive from personal earnings before taxes, that is, wages or salaries, including tips, bonuses, and overtime pay, and income from self-employment?".

[18] According to Online Appendix Table B2, each additional category of highest educational attainment is associated with an 9.2% increase in earnings. Moreover, a one standard increase in gross household income (in $000) is associated with 4.8% increase in log earnings in the long-run.

parents and re-estimate equation 1 for each subgroup.[19]

A comparison of Columns 2 and 3, as well as Columns 4 and 5, in Table 3 indicates that, in fact, students with less-educated and low-income parents are the ones who significantly benefit from higher peer grit. In other words, having gritty peers during high school significantly supports students from disadvantaged backgrounds, leading to increased earnings in the future. According to Sharafi (2023), poverty has a large and significant negative effect on perseverance, a facet of grit, causing students from economically disadvantaged backgrounds to exert less effort than their peers from wealthier backgrounds. Our results suggest that exposure to high school peers with higher grit can help bridge the gap in opportunities and resources for students from economically disadvantaged backgrounds.[20]

[Table 3 here]

4.3 Robustness checks

Our baseline specification includes a rich set of controls that are likely determinants of earnings, such as gender, age, race, highest level of education, AHPVT standardized test score (often considered a proxy for ability when taken at an early age—see, for example, Bifulco et al. (2011)), whether the respondent was born in the United States, parental education and income, number of siblings, whether the respondent is the first-born child in the family, and whether the respondent was living with both parents in Wave I. As a first robustness check, we explore whether our baseline results presented in Table 3 Column 1, are robust to the inclusion of non-standard controls, which may affect

[19]The information on parental education and household income comes from the parent questionnaire in Wave I (see Section 2). We define as low-income those with a parental household income below the median ($40,000). A low-educated parent is defined as someone whose highest level of education is high school or less.

[20]We also estimate the heterogeneous effects of peer grit based on students' own grit levels. To do this, we divide the students into two groups based on the median value of their own grit. As shown in Online Appendix Table B3 Columns 1 and 2, students with high levels of grit benefit more from having gritty high school peers, achieving higher earnings in adulthood. This finding aligns with the results of Zou (2024), who demonstrates that students with higher persistence levels gain significantly from having persistent peers in academic performance. Furthermore, our analysis reveals stronger effects for boys than girls (see Online Appendix Table B4), likely because boys exhibit higher average grit levels. However, a comparison of Online Appendix Table B3 Columns 3 and 4 with Columns 5 and 6, indicates that the low socioeconomic background continues to play an important role, irrespective of the level of one's own grit.

earnings but also potentially related to grit.[21] As shown in Appendix Table A3, our benchmark results—reproduced in Column 1—are robust to the inclusion of own and peer self-control (Column 2), confidence (Column 3), beauty (Column 4), self-reported health status (Column 5), Big Five traits (Column 6), and depression (column 7).[22] Including high school cohort size to assess whether variability in peer grit reflects the number of peers in the cohort, does not affect our estimates either (Column 8). Similarly, controlling for contextual characteristics, i.e., the full set of peer socioeconomic and family characteristics that may be correlated with peer grit, leaves our conclusions unchanged (Column 9). We also experiment with alternative methods for clustering standard errors beyond the school level, which serves as our baseline. As Appendix Table A4 shows, the results are robust if we cluster at the grade level (Column 1), school, grade level (Column 2), or school$\times$grade level (Column 3) level.

Our next exercise examines the validity of the assumption that peer comparisons in terms of grit are mainly made within the same cohort and among students with whom respondents are likely to interact the most. To validate this assumption, we run a series of placebo regressions by randomly assigning each respondent to a different cohort within their school. Specifically, we retain the same school but define placebo peers as students from higher or lower grades than the respondent's, repeating this procedure for a total of 1,000 placebo cohorts.[23] Appendix Figure A2 presents the distribution of the coefficients of placebo peer grit on (log) earnings for the 1,000 estimates. The vertical line in Appendix Figure A2 represents our benchmark coefficient estimate, which stands as a clear outlier in the distribution of the placebo estimates. This indicates that our estimated effects are unlikely to be driven by chance.

[21] See Online Appendix Table B5 for sample statistics for these additional variables.

[22] We construct a self-control measure similar to our grit measure, using the first factor derived from factor analysis applied to the following variables: (1) When making decisions, you usually go with your "gut feeling" without thinking too much about the consequences of each alternative; (2) When you have a problem to solve, one of the first things you do is get as many facts about the problem as possible; (3) When you are attempting to find a solution to a problem, you usually try to think of as many different ways to approach the problem as possible; (4) When making decisions, you generally use a systematic method for judging and comparing alternatives; and (5) After carrying out a solution to a problem, you usually try to analyze what went right and what went wrong. See Online Appendix Table B1 for definitions of other non-standard controls.

[23] See, for example, Merlino et al. (2019) and Adamopoulou and Kaya (2024) for a similar approach.

4.4 Other long-term outcomes

Does peer grit affect other outcomes in the long run beyond earnings? If so, do any of these outcomes serve as underlying channels? Table 4 examines the impact of own and peer grit on additional economic and labor market outcomes, such as the probability of being employed, working more than 10 hours per week, employment in a job aligned with long-term career goals, job satisfaction, other job characteristics (such as having a supervisory role, working in non-repetitive tasks, and participating in decision-making roles at work), and accumulated assets.

We do not find any statistically significant impact of peer grit on the probability of being employed (Column 1) or working more than 10 hours per week (Column 2), suggesting that peer grit is not likely to have a meaningful relationship with labor supply outcomes. However, those with gritty peers report higher job satisfaction (Column 3), are more likely to be employed in jobs aligned with their long-term career goals (Column 4), and accumulate more assets (Column 5). These findings highlight the lasting influence of a gritty peer environment during adolescence on career planning and financial stability. By contrast, we find no significant effect of peer grit on other job characteristics, such as the likelihood of holding a supervisory role (Column 5), working in non-repetitive tasks (Column 6), or participating in decision-making roles at work (Column 7).[24]

[Table 4 here]

What about the impact of peer grit on non-cognitive skills in the long-run? To address this question, Table 5 examines whether peer grit during high school affects personality and attitudes, which are important components of non-cognitive skills, in early adulthood. The estimates indicate that peer grit reduces risk aversion (Column 1) and decreases the frequency of feeling overwhelmed by difficulties (Column 2). These results imply that students surrounded by gritty peers may develop a greater willingness to take risks. Moreover, gritty peers appear to foster resilience, making

[24]We do not find any effect of peer grit on the probability of being self-employed either (results available upon request). This is based on Wave V during later adulthood, which is the only wave for which information on self-employment is available.

individuals less prone to feeling overwhelmed by difficulties.[25] However, we do not find evidence that the average grit of high-school peers affects any of the Big Five personality traits (Columns 4-7), including openness, conscientiousness, extraversion, agreeableness, or neuroticism.[26]

[Table 5 here]

4.5 Mechanisms

What drives the impact of the average grit of high school peers on future earnings? To explore this, we perform an analysis akin to mediation, where potential mechanism variables that we identified in Sections 4.1 and 4.4, are included as an additional control in our main specification (equation 1).

Table 6 reports the results. One potential mechanism for explaining the long-term impact of peer grit might be its role in enhancing an individual's own grit, which subsequently influences their future earnings. The effect of peer grit on earnings reduces slightly in absolute size compared to the benchmark estimate—reproduced in Column 1 for the sample of individuals with non missing information in own grit in Wave II—after accounting for an individual's own grit one year later (Column 2). Another potential channel could be risk aversion. A comparison of Columns 1 and 3 suggests that the positive effects of gritty peers remain fairly unchanged after adding risk aversion. As such, risk aversion does not appear to serve as an important mechanism to explain why students with grittier peers in high school tend to have higher earnings in early adulthood.[27]

The estimates presented in Table 6 reveal two additional potential explanations for the long-term effect of peer grit on earnings: a greater likelihood of perceiving one's

[25] As reported in Online Appendix Table B6, peer grit during high school has a lasting positive effect, making individuals less prone to feeling overwhelmed by difficulties and positively impacting their earnings in Wave V, when respondents are 34-43.

[26] According to Table 4 Panel B Column 5, the coefficient estimate of own grit on conscientiousness is 0.497, which is statistically significant at 0.01 level. This indicates that our grit measure is significantly correlated with conscientiousness.

[27] According to Zou (2024) and Golsteyn et al. (2021), students with more persistent peers are more likely to form friendship with persistent students. We confirm that students in cohorts with, on average, grittier peers are more likely to nominate friends who exhibit higher levels of grit. Additionally, students with grittier peers tend to report having more friends in early adulthood. However, factors such as friendship nominations, and the number of adulthood friends do not appear to serve as mechanisms in our analysis. These results are available upon request.

current job as part of long-term career goals (Column 4), and a decreased likelihood of feeling overwhelmed by difficulties (Column 5). When either of these variables is included as a control, the estimated effect of peer grit on earnings becomes insignificant and decreases in absolute size compared to the benchmark estimate (Column 1). This suggests that having gritty peers in high school may lead individuals to prioritize long-term career goals when making decisions about jobs and career paths. Additionally, gritty peers may foster greater resilience, making individuals less likely to feel overwhelmed by difficulties. These factors may explain why the grit level of high school peers can affect earnings in adulthood beyond its impact on education attainment.[28]

[Table 6 here]

5 Conclusion

Using data from the Add Health survey, this paper explores the impact of both individual and peer grit on long-term outcomes. By shifting the focus from more commonly studied peer effects (e.g., the influence of peer gender or race on academic achievement in the short run) to peer personality traits that are not easily observed and their long-term effects, we contribute to the established literature by demonstrating that peer grit affects long-term earnings in early adulthood.

In our analysis, we leverage the unique features of the Add Health survey, which tracks multiple cohorts within the same school and provides rich data on respondents' personalities and long-term economic and labor market outcomes. We identify the effect of peer grit during high school on future earnings by utilizing the random variation in peer grit across cohorts within the same school. We confirm the findings of the existing literature, which suggest that peer grit improves high school Math grades and increases the probability of enrolling in college. Furthermore, we find that students exposed to peers with higher grit during high school achieve higher earnings in early adulthood. Students from disadvantaged family backgrounds—those with low-educated or low-

[28] According to Online Appendix Table B6 (Columns 1 and 3) a reduced likelihood of feeling overwhelmed by difficulties remains a key mechanism explaining the positive impact of gritty peers on earnings in Wave V, when respondents are 34 to 43. Wave V does not include information on risk aversion or perceptions related to job alignment with career goals.

income parents—benefit significantly more from exposure to peers with higher grit. This increased exposure enhances their opportunities for long-term economic success, as measured by future earnings, and may help bridge socioeconomic gaps.

Exposure to gritty peers in high school also affects other long-term outcomes. In particular, it leads to greater accumulated assets, increased job satisfaction, and a higher likelihood of being employed at a job that is aligned with one's long-term career goals. The impact of peer grit also extends beyond economic outcomes, shaping personality and attitudes in adulthood. Exposure to gritty peers tends to increase one's own grit one year later. We also find that peer grit reduces risk aversion in early adulthood and decreases the likelihood of feeling unable to overcome difficulties in life.

Our further analysis reveal that increased own grit after one year, a higher likelihood of perceiving the current job as aligned with long-term career goals, and a decreased likelihood of feeling unable to overcome difficulties, act as mediators explaining why exposure to gritty peers in high school leads to higher earnings in early adulthood.

Our results have important implications for designing interventions and education policies aimed at improving students' personality and non-cognitive skills. Overlooking the positive spillovers of peer personality on individuals beyond the immediate environment may result in underestimating the social returns of grit-enhancing interventions. Furthermore, evaluations of such programs will be incomplete if the focus is solely on the benefits for short-run educational outcomes, neglecting the broader, longer-term impacts on economic success and personality traits.

References

Adamopoulou, E. and E. Kaya (2024). Beautiful Inside and Out: Peer Characteristics and Academic Performance. *Journal of Economic Behavior & Organization 217*, 507–532.

Aizer, A. (2009). Peer Effects, Institutions and Human Capital Accumulation: the Externalities of ADD. , NBER Working Paper, No. 14354.

Alan, S., T. Boneva, and S. Ertac (2019). Ever Failed, Try Again, Succeed Better: Results from a Randomized Educational Intervention on Grit. *The Quarterly Journal of Economics 134*(3), 1121–1162.

Alan, S. and S. Ertac (2018). Fostering Patience in the Classroom: Results from Randomized Educational Intervention. *Journal of Political Economy 126*(5), 1865–1911.

Alan, S. and S. Ertac (2019). Mitigating the Gender Gap in the Willingness to Compete: Evidence from a Randomized Field Experiment. *Journal of the European Economic Association 17*(4), 1147–1185.

Almlund, M., A. L. Duckworth, J. Heckman, and T. Kautz (2011). Personality Psychology and Economics. In *Handbook of the Economics of Education*, Volume 4, pp. 1–181. Elsevier.

Ammermueller, A. and J.-S. Pischke (2009). Peer Effects in European Primary Schools: Evidence from the Progress in International Reading Literacy Study. *Journal of Labor Economics 27*(3), 315–348.

Antecol, H., O. Eren, and S. Ozbeklik (2016). Peer Effects in Disadvantaged Primary Schools: Evidence from a Randomized Experiment. *Journal of Human Resources 51*(1), 95–132.

Belot, M. and J. V. de Ven (2011). Friendships and Favouritism on the Schoolground – A Framed Field Experiment. *The Economic Journal 121*(557), 1228–1251.

Bietenbeck, J. (2024). Do Motivated Classmates Matter for Educational Success? *The Economic Journal*. ueae060.

Bifulco, R., J. M. Fletcher, and S. L. Ross (2011). The Effect of Classmate Characteristics on Post-secondary Outcomes: Evidence from the Add Health. *American Economic Journal: Economic Policy 3*(1), 25–53.

Black, S. E., P. J. Devereux, and K. G. Salvanes (2013). Under Pressure? The Effect of Peers on Outcomes of Young Adults. *Journal of Labor Economics 31*(1), 119–153.

Bolyard, A. and P. A. Savelyev (2024). Understanding the Educational Attainment Polygenic Index and Its Interactions with SES in Determining Health in Young Adulthood. , IZA Discussion Paper, No. 17056.

Borghans, L., A. L. Duckworth, J. J. Heckman, and B. terWeel (2008). The Economics and Psychology of Personality Traits. *Journal of Human Resources 43*(4), 972–1059.

Buechel, B., L. Mechtenberg, and J. Petersen (2018). If I Can Do It, So Can You! Peer Effects on Perseverance. *Journal of Economic Behavior & Organization 155*, 301–314.

Burke, M. A. and T. R. Sass (2013). Classroom Peer Effects and Student Achievement. *Journal of Labor Economics 31*(1), 51–82.

Carrell, S. E., M. Hoekstra, and E. Kuka (2018). The Long-run Effects of Disruptive Peers. *American Economic Review 108*(11), 3377–3415.

Cools, A., R. Fernández, and E. Patacchini (2022). The Asymmetric Gender Effects of High Flyers. *Labour Economics 79*, 102287.

Denning, J. T., R. Murphy, and F. Weinhardt (2023). Class Rank and Long-run Outcomes. *Review of Economics and Statistics 105*(6), 1426–1441.

Duckworth, A. L., C. Peterson, M. D. Matthews, and D. R. Kelly (2007). Grit: Perseverance and Passion for Long-term Goals. *Journal of Personality and Social Psychology 92*(6), 1087.

Duckworth, A. L. and P. D. Quinn (2009). Development and Validation of the Short Grit Scale (GRIT–S). *Journal of Personality Assessment 91*(2), 166–174.

Feld, J. and U. Zölitz (2022). The Effect of Higher-achieving Peers on Major Choices and Labor Market Outcomes. *Journal of Economic Behavior & Organization 196*, 200–219.

Fernández-Villaverde, J. G. Jesús, and N. Guner (2014). From Shame to Game in One Hundred Years: An Economic Model of the Rise in Premarital Sex and its De-Stigmatization. *Journal of the European Economic Association 12*(1), 25–61.

Fletcher, J. M. (2013). The Effects of Personality Traits on Adult Labor Market Outcomes: Evidence from Siblings. *Journal of Economic Behavior & Organization 89*, 122–135.

Gerhards, L. and C. Gravert (2020). Because of You I Did Not Give up – Peer Effects in Perseverance. *Journal of Economic Psychology 81*, 102316.

Golsteyn, B. H., H. Grönqvist, and L. Lindahl (2014). Adolescent Time Preferences Predict Lifetime Outcomes. *The Economic Journal 124*(580), F739–F761.

Golsteyn, B. H. H., A. Non, and U. Zölitz (2021). The Impact of Peer Personality on Academic Achievement. *Journal of Political Economy 129*(4), 1052–1099.

Gong, J., Y. Lu, and H. Song (2021). Gender Peer Effects on Students' Academic and Noncognitive Outcomes: Evidence and Mechanisms. *Journal of Human Resources 56*(3), 686–710.

Graham, B. S. (2015). Methods of Identification in Social Networks. *Annual Review of Economics 7*(1), 465–485.

Guryan, J., K. Kroft, and M. J. Notowidigdo (2009). Peer Effects in the Workplace: Evidence from Random Groupings in Professional Golf Tournaments. *American Economic Journal: Applied Economics 1*(4), 34–68.

Hancock, S. A. and A. J. Hill (2022). The Effect of Teammate Personality on Team Production. *Labour Economics 78*, 102248.

Harman, H. H. (1967). *Modern Factor Analysis*. The University of Chicago Press.

Heckman, J., R. Pinto, and P. Savelyev (2013). Understanding the Mechanisms through Which an Influential Early Childhood Program Boosted Adult Outcomes. *American Economic Review 103*(6), 2052–2086.

Hoxby, C. M. (2000). Peer Effects in the Classroom: Learning from Gender and Race Variation.

Kaiser, H. F. (1960). The Application of Electronic Computers to Factor Analysis. *Educ. and Psychological Measurement 20*(1), 141–51.

Kiessling, L. and J. Norris (2023). The Long-Run Effects of Peers on Mental Health. *The Economic Journal 133*(649), 281–322.

Lam, K. K. L. and M. Zhou (2022). Grit and Academic Achievement: A Comparative Cross-cultural Meta-Analysis. *Journal of Educational Psychology 114*(3), 597.

Lavy, V. and A. Schlosser (2011). Mechanisms and Impacts of Gender Peer Effects at School. *American Economic Journal: Applied Economics 3*(2), 1–33.

Lépine, A. and F. Estevan (2021). Do Ability Peer Effects Matter for Academic and Labor Market Outcomes? *Labour Economics 71*, 102022.

McPherson, M., L. Smith-Lovin, and J. M. Cook (2001). Birds of a Feather: Homophily in Social Networks. *Annual Review of Sociology 27*(1), 415–444.

Merlino, L. P., M. F. Steinhardt, and L. Wren-Lewis (2019). More than Just Friends? School Peers and Adult Interracial Relationships. *Journal of Labor Economics 37*(3), 663–713.

Merlino, L. P., M. F. Steinhardt, and L. Wren-Lewis (2024). The Long Run Impact of Childhood Interracial Contact on Residential Segregation. *Journal of Public Economics 239*(3), 105242.

Pagani, L., S. Comi, and F. Origo (2021). The Effect of School Rank on Personality Traits. *Journal of Human Resources 56*(4), 1187–1225.

Papageorge, N. W. and K. Thom (2020). Genes, Education, and Labor market outcomes: Evidence from the Health and Retirement Study. *Journal of the European Economic Association 18*(3), 1351–1399.

Santos, I., V. Petroska-Beska, P. Carneiro, L. Eskreis-Winkler, A. M. M. Boudet, I. Berniell, C. Krekel, O. Arias, and A. L. Duckworth (2022). Can Grit Be Taught? Lessons from a Nationwide Field Experiment with Middle-School Students. , IZA Discussion Paper, No. 15588.

Savelyev, P. A. (2022). Conscientiousness, Extraversion, College Education, and Longevity of High-Ability Individuals. *Journal of Human Resources 57*(5), 1526–1565.

Shan, X. and U. Zölitz (2022). Peers Affect Personality Development. , CEPR Discussion Paper No. DP17241.

Sharafi, Z. (2023). Poverty and Perseverance: The Detrimental Effect of Poverty on Effort Provision. *Journal of Development Economics 162*, 103040.

Shure, N. (2021). Non-cognitive Peer Effects in Secondary Education. *Labour Economics 73*, 102074.

Sisk, V. F., A. P. Burgoyne, J. Sun, J. L. Butler, and B. N. Macnamara (2018). To What Extent and Under Which Circumstances Are Growth Mind-Sets Important to Academic Achievement? Two Meta-Analyses. *Psychological Science 29*(4), 549–571.

Sorrenti, G., U. Zölitz, D. Ribeaud, and M. Eisner (2024). The Causal Impact of Socio-Emotional Skills Training on Educational Success. *Review of Economic Studies*. rdae018.

Van Lent, M. (2024). Peer Creativity and Academic Achievement. , IZA Discussion Paper, No. 11910.

Xu, D., Q. Zhang, and X. Zhou (2022). The Impact of Low-Ability Peers on Cognitive and Noncognitive Outcomes: Random Assignment Evidence on the Effects and Operating Channels. *Journal of Human Resources 57*(2), 555–596.

Yeager, D. S. and C. S. Dweck (2012). Mindsets That Promote Resilience: When Students Believe That Personal Characteristics Can Be Developed. *Educational Psychologist 47*(4), 302–314.

Zimmerman, D. J. (2003). Peer Effects in Academic outcomes: Evidence from a Natural Experiment. *Review of Economics and statistics 85*(1), 9–23.

Zou, J. (2024). The Peer Effect of Persistence on Student Achievement. *Economics of Education Review 102*, 102574.

Table 1: Descriptive Statistics

Variables	N	Mean	SD	Min	Max
	(1)	(2)	(3)	(4)	(5)
			Grit measure (Wave I)		
Own Grit	5,772	0.026	0.755	-3.263	1.149
Peer grit	5,772	0.028	0.191	-0.840	0.639
			Demographic characteristics		
% Male	5,772	0.510	0.500	0	1
Highest level of education	5,772	5.766	2.122	1	13
Age	5,772	28.15	1.770	24	32
% White	5,767	0.782	0.413	0	1
% Black	5,767	0.130	0.336	0	1
% Hispanic	5,761	0.114	0.318	0	1
% Asian	5,767	0.038	0.191	0	1
% Foreign born	5,772	0.049	0.217	0	1
			Ability proxy and family of origin char.		
AHPVT standardized score	5,772	102.6	13.71	10	137
Parental educational level	5,772	1.676	0.994	0	3
Gross HH Income in 000 $	5,772	47.49	46.68	0	999
% Two-parent family	5,772	0.686	0.464	0	1
Number of siblings	5,772	1.397	1.132	0	10
% First-born	5,772	0.430	0.495	0	1
			Wave IV outcomes		
Log(earnings)	5,772	10.20	0.844	6.620	11.92
Asset tiers	5,320	3.718	1.912	1	9
Not employed	6,307	0.066	0.249	0	1
Hours $\geq$ 10	5,466	0.792	0.406	0	1
% Managerial position	5,737	0.389	0.488	0	1
% Non-repetitive tasks	5,736	0.373	0.484	0	1
Decision making at work	5,736	1.943	0.933	0	3
Job satisfaction	5,737	2.880	0.917	0	4
Job aligned with career goals	5,735	0.673	0.469	0	1
			Wave IV traits		
Risk aversion	5,769	2.990	0.999	1	5
Overcome difficulties	5,771	2.840	1.007	0	4
Extraversion	5,769	13.41	3.023	4	20
Neuroticism	5,769	10.36	2.736	4	20
Agreeableness	5,769	15.32	2.399	4	20
Conscientiousness	5,769	14.60	2.669	5	20
Openness	5,744	14.61	2.437	4	20
			Wave I-III outcomes		
Math grade in wave I	5,427	2.744	1.025	1	4
Science grade in wave I	5,125	2.892	1.005	1	4
English grade in wave I	5,680	2.875	0.959	1	4
History grade in wave I	5,135	2.946	0.998	1	4
GPA in wave I	5,739	2.854	0.767	1	4
% Enrolled in college in wave III	5,769	0.607	0.489	0	1

Note: See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables. Corrected for the design effects of the Add Health sampling process.

Table 2: Effect of Peer Grit on Short-run Outcomes

	(1) Math grade	(2) Science grade	(3) English grade	(4) History grade	(5) GPA	(6) College enrollment	(7) Own grit (Wave II)
Peer grit	0.272*	0.092	-0.026	-0.156	0.035	0.144**	0.221*
	(0.145)	(0.124)	(0.143)	(0.127)	(0.089)	(0.064)	(0.125)
Own grit	0.181***	0.157***	0.158***	0.130***	0.159***	0.044***	0.452***
	(0.024)	(0.023)	(0.021)	(0.025)	(0.017)	(0.009)	(0.022)
Observations	5,427	5,125	5,680	5,135	5,739	5,769	4,510
School FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dep. Var. Mean	2.744	2.892	2.875	2.946	2.854	0.607	0.0392

Note: Corrected for the design effects of the Add Health sampling process. All specifications include baseline controls (excluding the highest level of education), as well as school and cohort fixed effects. See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables. Standard errors clustered at the school level are in parentheses. *p<.10; **p<.05; ***p<.01.

Table 3: Effect of Peer Grit on (Log) Annual Gross Earnings

	Dep. var.: Log(earnings)				
	(1)	(2)	(3)	(4)	(5)
		By Parental education		By Parental income	
	All	Low	High	Low	High
Peer grit	0.199**	0.283**	0.082	0.270*	0.070
	(0.093)	(0.118)	(0.154)	(0.161)	(0.125)
Own grit	0.080***	0.070**	0.082***	0.082**	0.082***
	(0.022)	(0.029)	(0.029)	(0.031)	(0.029)
Observations	5,772	2,458	3,314	2,808	2,963
School FE	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Dep. Var. Mean	10.20	10.11	10.27	10.03	10.36

Note: Corrected for the design effects of the Add Health sampling process. All specifications include baseline controls, as well as school and cohort fixed effects. See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables. Standard errors clustered at the school level are in parentheses. *p<.10; **p<.05; ***p<.01.

Table 4: Effect of Peer Grit on Other Long-term Economic and Labor Market Outcomes

	(1) Not employed	(2) Hours $\geq$ 10	(3) Job satisfaction	(4) Job aligned with career goals	(5) Supervisory role	(6) Non repetitive tasks	(7) Decision-making job	(8) Assets tier
Peer grit	-0.044	0.100	0.200*	0.111**	0.014	0.097	-0.010	0.421**
	(0.029)	(0.066)	(0.115)	(0.054)	(0.067)	(0.068)	(0.123)	(0.209)
Own grit	-0.000	0.013	0.069***	0.036***	0.027**	0.025**	0.051**	0.190***
	(0.005)	(0.010)	(0.023)	(0.011)	(0.012)	(0.011)	(0.023)	(0.048)
Observations	6,307	5,466	5,737	5,735	5,737	5,736	5,736	5,320
School FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dep. Var. Mean	0.0662	0.792	2.880	0.670	0.389	0.373	1.943	3.718

Note: Corrected for the design effects of the Add Health sampling process. All specifications include baseline controls, as well as school and cohort fixed effects. The asset tiers are: less than $5,000, $5,000 to $9,999, $10,000 to $24,999, $25,000 to $49,999, $50,000 to $99,999, $100,000 to $249,999, $250,000 to $499,999, $500,000 to $999,999, $1,000,000 or more. See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables. Standard errors clustered at the school level are in parentheses. *p<.10; **p<.05; ***p<.01.

Table 5: Effect of Peer Grit on Personality and Attitudes in Early Adulthood

	(1) Risk aversion	(2) Overcome difficulties	(3) Openness	(4) Conscientiousness	(5) Extraversion	(6) Agreeableness	(7) Neuroticism
Peer grit	-0.257**	0.217*	-0.087	0.143	-0.470	-0.004	0.023
	(0.125)	(0.130)	(0.307)	(0.329)	(0.420)	(0.296)	(0.336)
Own grit	0.035	0.191***	0.027	0.497***	0.160*	0.056	-0.570***
	(0.024)	(0.026)	(0.056)	(0.076)	(0.082)	(0.051)	(0.061)
Observations	5,769	5,771	5,744	5,769	5,769	5,769	5,769
School FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dep. Var. Mean	2.990	2.840	14.61	14.60	13.41	15.32	10.36

Note: Corrected for the design effects of the Add Health sampling process. All specifications include baseline controls, as well as school and cohort fixed effects. See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables. Standard errors clustered at the school level are in parentheses. *p<.10; **p<.05; ***p<.01.

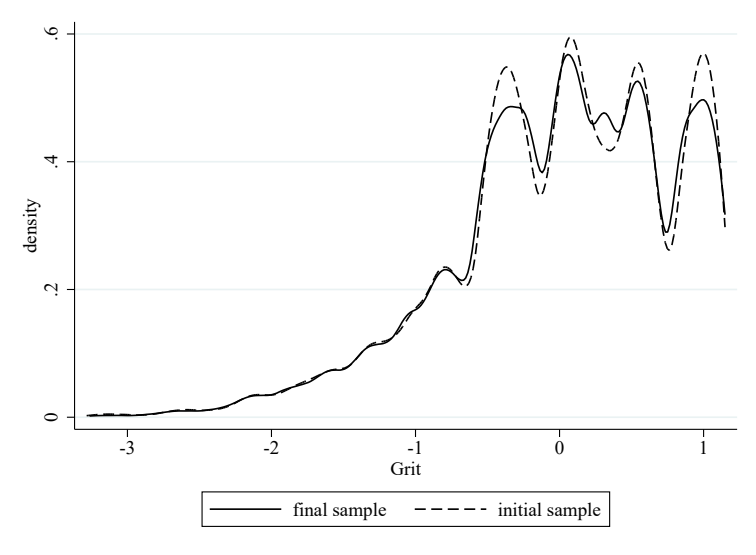
Table 6: Underlying Mechanisms

	Dep. var.: Log(earnings)					
	(1)	(2)	(3)	(4)	(5)	(6)
Peer grit	0.192*	0.181*	0.194*	0.129	0.159	0.099
	(0.107)	(0.107)	(0.106)	(0.104)	(0.099)	(0.095)
Own grit	0.089***	0.066***	0.089***	0.072***	0.069**	0.038
	(0.025)	(0.022)	(0.025)	(0.025)	(0.026)	(0.024)
Own grit (Wave II)		0.052**				0.038*
		(0.023)				(0.023)
Risk aversion			0.007			0.006
			(0.015)			(0.014)
Job aligned with career goals				0.419***		0.406***
				(0.041)		(0.040)
Overcome difficulties					0.116***	0.101***
					(0.018)	(0.018)
Observations	4,449	4,449	4,449	4,449	4,449	4,449
School FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Dep. Var. Mean	10.17	10.17	10.17	10.17	10.17	10.17

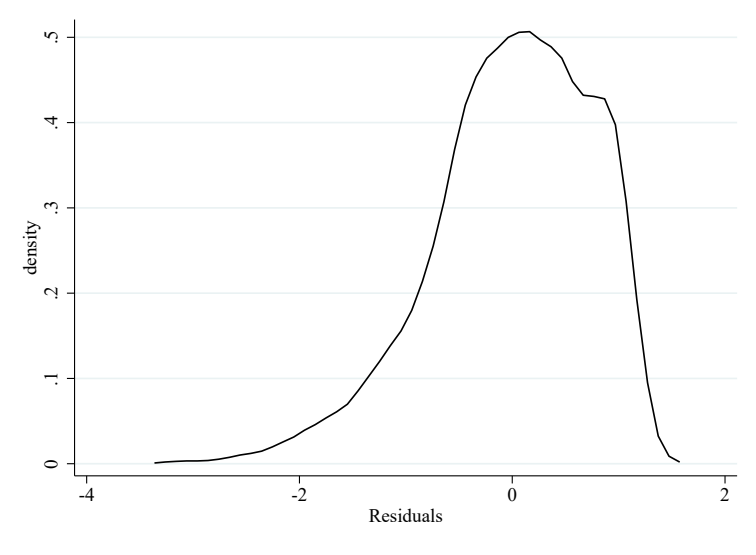
Note: Corrected for the design effects of the Add Health sampling process. To maintain a consistent sample size across all mediation factors, Column 1 presents the baseline estimation using a sample where own grit (Wave II) is observable. All specifications include baseline controls, as well as school and cohort fixed effects. See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables. Standard errors clustered at the school level are in parentheses. *p<.10; **p<.05; ***p<.01.

Appendix

Figure A1: Distribution of Grit Measure



(a) Raw grit measure



(b) Grit residuals

Note: Figure (a) plots the distribution of grit measure, constructed using Add Health questions in Online Appendix Table B1. The initial sample represents the original dataset, while final sample refers to the sample used in the main analysis. Figure (b) displays the distribution of grit in the final sample that cannot be explained by baseline controls. A lower number indicate a lower grit measure.

Table A1: Variance Decomposition

Variable	Within	Between	Total
Grit	0.059	0.030	0.089
	66.58%	33.42%	

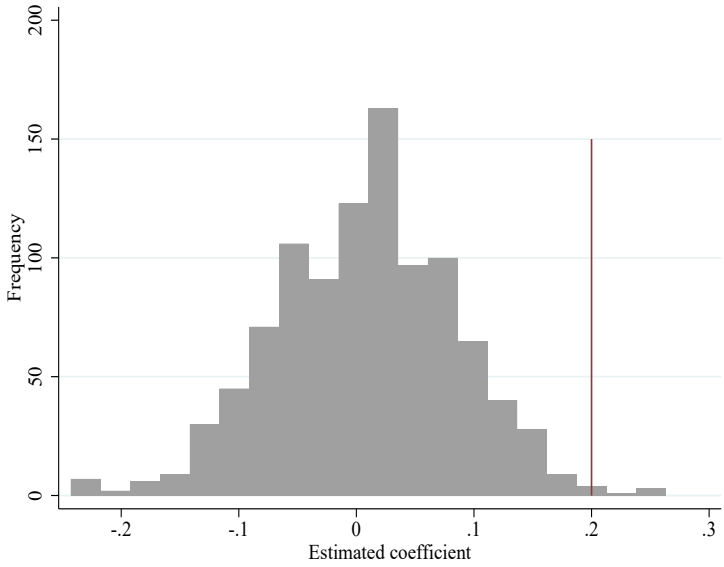
Note: The variance decomposition is performed following Ammermueller and Pischke (2009) by first computing the cohort averages of each variable, and then decomposing the total variance in these cohort averages into within school and between school variances. Percentages are a proportion of total variance. There are 130 different schools and 462 different school-cohorts in the final sample. See text for sample restrictions.

Table A2: Balancing Tests

	Peer grit$_{-i}$	
	(1)	(2)
Own grit	0.000	0.000
	(0.004)	(0.004)
Observations	5,772	5,772
School FE	Yes	Yes
Cohort FE	Yes	Yes
Leave-out school average	Yes	Yes
Predetermined characteristics	No	Yes
p-value	-	0.341

Note: Presented are the unweighted balancing test results following the correction procedure outlined in Guryan et al. (2009). Peer grit is the average grit of peers in the school, excluding individual i. Predetermined characteristics are gender, age, race, foreign-born, highest level of education, parental education, Add Health Picture Vocabulary standardized test (AHPVT) score in Wave 1 (ability proxy), household income in Wave 1, number of siblings, whether the respondent is the first born child in the family, and whether the respondent was living with both parents in Wave 1. The p-value represents the joint significance of predetermined characteristics controls. See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables. Standard errors clustered at the school level are in parentheses. *p<.10; **p<.05; ***p<.01.

Figure A2: Placebo Estimates



Note: Figure shows the estimated coefficients of the (log) earnings equation when the placebo peers are used, and the procedure is repeated 1,000 times. Placebo peers are students from the same school as the respondent but from a different (randomly assigned) cohort. The regressions include baseline controls, as well as school and cohort fixed effects. The vertical line represents the benchmark coefficient estimate presented in Table 3 Panel A Column 1.

Table A3: Effects of Peer Grit on Earnings - Robustness Checks with Additional Controls

	Dep. var.: Log(earnings)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Peer grit	0.199**	0.206**	0.199**	0.191*	0.215**	0.224**	0.221**	0.200**	0.223**
	(0.093)	(0.093)	(0.093)	(0.097)	(0.094)	(0.090)	(0.097)	(0.094)	(0.102)
Grit	0.080***	0.075***	0.080***	0.078***	0.071***	0.057**	0.080***	0.080***	0.081***
	(0.022)	(0.022)	(0.022)	(0.021)	(0.022)	(0.023)	(0.024)	(0.022)	(0.022)
Observations	5,772	5,737	5,772	5,763	5,762	5,688	5,716	5,772	5,741
School FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional control	Benchmark	Self-control	Confidence	Beauty	Health	Big5	Depression	Cohort size	Contextual

Note: The regressions include school and cohort fixed effects. Baseline controls: age, gender, race, highest level of education, whether the respondent was born in the United States, maternal education, parental income, number of siblings, whether the respondent is the first-born child in the family, and whether the respondent was living with both parents in Wave I. Additional controls: Col. (2) Own and peer self-control; Col. (3) Own and peer self-confidence; Col. (4) Own and peer beauty; Col. (5) own and peer self-reported health status; Col. (6) own and peer Big five traits; Col. (7) own and peer depression; Col. (8) Cohort size; Col. (9) contextual characteristics (the peer average of all individual controls). See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables. Standard errors clustered at the school level are in parentheses. *p<.10; **p<.05; ***p<.01.

Table A4: Effects of Peer Grit on Earnings - Robustness Checks with Alternative Clustering

	Dep. var.: Log(earnings)		
	(1)	(2)	(3)
Peer grit	0.223**	0.223*	0.223**
	(0.068)	(0.098)	(0.087)
Own grit	0.081***	0.081**	0.081***
	(0.016)	(0.020)	(0.019)
Observations	5,741	5,741	5,741
School FE	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
SE Cluster	Grade	School, Grade	School×Grade
No. Cluster	6	6	453
Dep. Var. Mean	10.20	10.20	10.20

Note: Corrected for the design effects of the Add Health sampling process. All specifications include baseline controls, as well as school and cohort fixed effects. See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables. Standard errors clustered at the level indicated within each column are in parentheses. *p<.10; **p<.05; ***p<.01.

Online Appendix

A. Grit Measure

Our measure of grit is based on a set of questions from the Add Health survey which closely align with the Short Grit Scale introduced and validated by Duckworth and Quinn (2009). As using all these variables simultaneously may lead to multicollinearity issues, we use factor analysis to create a single grit variable from responses to these questions. Factor analysis identifies the latent structure underlying a group of observed variables (Harman, 1967). Latent factors are unobserved variables that cannot be directly measured but may affect the observed outcomes. In this study, the latent factor is grit, which influences the responses to these questions in the Add Health dataset.

We apply factor analysis using the iterated principal-factor method on the responses to the seven survey questions (see Table below). We find that the first factor is the only one with an eigenvalue greater than one (1.35), which aligns with the Kaiser criterion (Kaiser, 1960), a common rule of thumb in the literature. As such, we use the first factor as our grit measure following a varimax rotation. This single grit factor explains more than 58% (48% after rotation) of the total variance observed. Table below presents the relevance of each Add Health question in the grit factor.

Table: Rotated Factor Loadings

Add Health Questions Related to Grit	Factor Loadings
You had trouble keeping your mind on what you were doing.	0.519
Difficult problems make you very upset.	0.142
When you get what you want, it's usually because you worked hard for it.	0.087
It was hard to get started doing things.	0.609
You felt that you were too tired to do things.	0.609
You usually go out of your way to avoid having to deal with problems in your life.	0.034
You feel like you are doing everything just about right.	0.250

Note: This table displays the seven questions we select from Add Health survey Wave I for grit measure and the relevance of each Add Health questions in the grit factor.

B. Additional Tables

Table B1: Variable Descriptions

Variable description	Values
Earnings: Annual gross earnings in Wave IV (in US dollars)	[0,999995]
Not employed: Annual gross earnings in Wave IV equal to zero	0 No 1 Yes
Hours $\geq$ 10: Whether the respondent currently working for pay at least 10 hours a week (Wave IV)	0 No 1 Yes
Job satisfaction: How satisfied the respondent is with their current job as a whole (Wave IV)	0 extremely dissatisfied 1 dissatisfied 2 neither satisfied nor dissatisfied 3 satisfied 4 extremely satisfied
Job aligned with career goals: Current/Most recent primary job in relation to career goals (Wave IV)	0 it is not related to or do not have a long-term career or work goals 1 it is preparation for or part of long-term career or work goals
Supervisory responsibilities: Whether supervises other employees at current/most recent primary job (Wave IV)	0 if does not supervise anyone 1 if supervises other employees
Non-repetitive tasks: How much of the time does the same things repeatedly (Wave IV)	0 some of the time or more 1 none or almost none of the time
Decision-making job: How often has the freedom to make important decisions (Wave IV)	0 none or almost none of the time 1 some of the time 2 most of the time 3 all or almost all of the time
Assets: Self-reported tier of assets in Wave IV	[1 (less than $5,000),9 ($1,000,000 or more)]
Risk aversion: Agreement with the statement, "I like to take risks" (Wave IV)	1 strongly agree 2 agree 3 neither agree nor disagree 4 disagree 5 strongly disagree
Overcome difficulties: Self-reported frequency in the last 30 days (Wave IV)	0 very often 1 fairly often 2 sometimes 3 almost never 4 never
Extraversion (Wave V)	[4 20]
Agreeableness (Wave V)	[4 20]
Neuroticism (Wave V)	[4 20]
Conscientiousness (Wave V)	[5 20]
Openness: Open to Experience/Intellect/Immagination (Wave V)	[4 20]
Mathematics/Science/History/English grade in Wave I	1 A 2 B 3 C 4 D or lower
GPA: Average of the Maths, Science, English and History grades in Wave I	[0,4]
College enrollment: Whether the respondent has ever been enrolled in college by Wave III	0 if not enrolled in college 1 if enrolled in college

Table B1: Variable descriptions (cont.)

Age: Calculated age at time of interview in Wave IV	[24, 32]
Gender (Wave IV)	0 Female 1 Male
Race: Self-reported in Wave III	0 Non Hispanic white 1 Black or African American 2 Hispanic or Latino origin 3 other (Asian or Native)
Foreign-born: Whether the respondent was born in the US (self-reported in Wave I)	0 yes 1 no
Parental education: Reported by the respondent's parent in Wave I	0 less than high school 1 high school or similar 2 more than high school 3 college or more
Gross household income: Reported by the respondent's parent in Wave I (in $000)	[0,999]
Number of siblings: Constructed using the information on household roster in Wave I	[0, 12]
First-child: Constructed using the information on household roster in Wave I	0 otherwise 1 if first-born child in the family
Two-parent family: Constructed using the information on household roster in Wave I	0 otherwise 1 if co-resident with both mother and father
AHPVT in Wave I: Add Health Picture Vocabulary Test standardized score	[10,137]
The highest level of education achieved to date (Wave IV)	[1 (8th grade or less),13 (post baccalaureate professional education)]
Beauty: Interviewer's rating on the physical attractiveness of the respondent in Wave I	0 otherwise 1 if "attractive" or "very attractive"
Self-confidence: Self-assessment of own intelligence compared with that of people of the same age (Wave I)	1 moderately below average 2 slightly below average 3 about average 4 slightly above average 5 moderately above average 6 extremely above average
Depressed: Self-reported frequency of feeling depressed in the past week (Wave I)	0 never or rarely 1 sometimes 2 a lot of the time 3 most of the time or all of the time
Health: Self-reported general health in Wave I	0 excellent 1 very good 2 good 3 fair 4 poor
Self-control: Constructed using factor analysis based on five variables listed in the text (Wave I)	[-3.579, 1.460]
Cohort size	Average number of peers in the same school and grade as the respondent
Contextual characteristics	% Male peers Average peer highest level of education % White peers % Black peers % Hispanic peers % Asian peers % Foreign-born peers Average peer PVT standardized score % peers with college educated mothers Average peer gross HH income in 000 $ % Peers from two-parent families Average peer number of siblings % First-born peers

Table B1: Variable descriptions (cont.)

You had trouble keeping your mind on what you were doing.	0 most of the time or all of the time 1 a lot of the time 2 sometimes 3 never or rarely
Difficult problems make you very upset.	1 strongly agree 2 agree 3 neither agree nor disagree 4 disagree 5 strongly disagree
When you get what you want, it's usually because you worked hard for it.	1 strongly disagree 2 disagree 3 neither agree nor disagree 4 agree 5 strongly agree
It was hard to get started doing things.	0 most of the time or all of the time 1 a lot of the time 2 sometimes 3 never or rarely
You felt that you were too tired to do things.	0 most of the time or all of the time 1 a lot of the time 2 sometimes 3 never or rarely
You usually go out of your way to avoid having to deal with problems in your life.	1 strongly agree 2 agree 3 neither agree nor disagree 4 disagree 5 strongly disagree
You feel like you are doing everything just about right.	1 strongly disagree 2 disagree 3 neither agree nor disagree 4 agree 5 strongly agree

Table B2: Effects of Peer Grit on (Log) Annual Gross Earnings - Full Specification

	(1) Dep. var.: Log(earnings)
Own grit	0.080***
	(0.022)
Peer Grit	0.199**
	(0.093)
Male	0.393***
	(0.032)
Age	-0.031
	(0.023)
Black	-0.223***
	(0.055)
Hispanic	0.049
	(0.062)
Asian	0.048
	(0.078)
Foreign born	0.072
	(0.078)
AHPVT standardized score	0.001
	(0.001)
Highest level of education	0.088***
	(0.008)
Parental education: High school or similar	0.099**
	(0.049)
Parental education: More than high school	0.046
	(0.057)
Parental education: college or more	0.092*
	(0.054)
Gross HH income in $000	0.001*
	(0.000)
Number of siblings	0.015
	(0.013)
Firstborn	0.015
	(0.029)
Two-parent family	0.011
	(0.036)
Observations	5,772
School FE	Yes
Cohort FE	Yes

Note: Corrected for the design effects of the Add Health sampling process. The specification includes school and cohort fixed effects. See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables. Standard errors clustered at the school level are in parentheses. *p<.10; **p<.05; ***p<.01.

Table B3: Heterogeneity Analysis by Own Grit and Parental Education

	(1)	(2)	(3)	(4)	(5)	(6)
			High-educated parents		Low-educated parents	
	High own grit	Low own grit	High own grit	Low own grit	High own grit	Low own grit
Peer grit	0.314**	0.189	0.278	-0.047	0.357**	0.387**
	(0.128)	(0.143)	(0.170)	(0.262)	(0.174)	(0.193)
Own grit	0.190***	-0.017	0.246***	-0.070	0.145	0.018
	(0.058)	(0.039)	(0.081)	(0.058)	(0.088)	(0.051)
Observations	2,888	2,884	1,688	1,617	1,196	1,254
School FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Dep. Var. Mean	10.26	10.14	10.34	10.21	10.16	10.06

Note: High grit refers to grit levels at and above the median, while low grit refers to grit levels below the median. Corrected for the design effects of the Add Health sampling process. All specifications include baseline controls, as well as school and cohort fixed effects. See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables. Standard errors clustered at the school level are in parentheses. *p<.10; **p<.05; ***p<.01.

Table B4: Heterogeneity Analysis by Gender

	(1) Boys	(2) Girls
Peer grit	0.376**	0.048
	(0.150)	(0.130)
Own grit	0.072***	0.079***
	(0.024)	(0.029)
Observations	2,743	3,029
School FE	Yes	Yes
Cohort FE	Yes	Yes
Controls	Yes	Yes

Note: Corrected for the design effects of the Add Health sampling process. All specifications include baseline controls (excluding gender), as well as school and cohort fixed effects. See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables. Standard errors clustered at the school level are in parentheses. *p<.10; **p<.05; ***p<.01.

Table B5: Descriptive Statistics for Wave V Outcomes and Non-standard Controls

Variables	N	Mean	SD	Min	Max
	(1)	(2)	(3)	(4)	(5)
			Wave V outcomes		
Earnings tiers	4,132	7.358	3.115	1	13
Overcome difficulties	4,132	2.735	1.008	0	4
			Wave IV variables		
			Non-standard controls		
Own self-control	5,737	-0.043	0.804	-3.579	1.460
Peer self-control	5,737	-0.034	0.195	-0.716	0.561
Own self-confidence	5,770	3.924	1.056	1	6
Peer self-confidence	5,770	3.875	0.294	2.333	5.192
Own beauty	5,763	0.505	0.500	0	1
Peer beauty	5,763	0.512	0.126	0	1
Own health status	5,772	2.326	0.896	1	5
Peer health status	5,762	2.320	0.258	1.333	3.333
Own depression	5,772	0.495	0.738	0	3
Peer depression	5,716	0.507	0.252	0	1.750
Cohort size	5,772	17.63	20.91	1	141
			Contextual characteristics		
% Male peers	5,762	0.449	0.107	0.0909	1
Average peer highest level of education	5,772	5.864	2.109	1	13
% White peers	5,767	0.725	0.286	0	1
% Black peers	5,767	0.180	0.251	0	1
% Hispanic peers	5,761	0.112	0.182	0	0.925
% Asian peers	5,767	0.045	0.105	0	0.947
% Foreign-born peers	5,769	0.061	0.107	0	0.750
Average peer PVT standardized score	5,771	100.9	6.514	81.06	123.7
% peers with college educated mothers	5,768	0.244	0.163	0	0.955
Average peer gross HH income in 000 $	5,767	47.25	21.24	13	247
% Peers from two-parent families	5,772	0.682	0.150	0	1
Average peer number of siblings	5,772	1.450	0.328	0.300	3.333
% First-born peers	5,772	0.353	0.111	0	1

Note: Corrected for the design effects of the Add Health sampling process. See text for sample restrictions and Online Appendix Table B1 for the definitions of all variables.

Table B6: Underlying Mechanisms and Persistence: Evidence from Wave V

	(1) Earnings tier	(2) Overcome difficulties	(3) Earnings tier
Peer grit	0.666*	0.286*	0.536
	(0.397)	(0.154)	(0.387)
Own grit	0.376***	0.188***	0.290***
	(0.087)	(0.031)	(0.089)
Overcome difficulties			0.454***
			(0.068)
Observations	4,132	4,132	4,132
School FE	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Mean	7.358	2.735	7.358

Note: Earnings are reported in tiers in Wave V of Add Health, rather than as a continuous variable as in Wave IV. The earnings tiers are: less than $5,000, $5,000 to $9,999, $10,000 to $14,999, $15,000 to $19,999, $20,000 to $24,999, $25,000 to $29,999, $30,000 to $39,999, $40,000 to $49,999, $50,000 to $74,999, $75,000 to $99,999, $100,000 to $149,999, $150,000 to $199,999, and $200,000 or more. The regressions include school and cohort fixed effects. Controls are age, gender, race, highest level of education, whether the respondent was born in the United States, maternal education, parental income, number of siblings, whether the respondent is the first-born child in the family, and whether the respondent was living with both parents in Wave I. See Appendix Table B1 for the definitions of all variables. Standard errors clustered at the school level are in parentheses. *p<.10; **p<.05; ***p<.01.