Child disability spillovers on schoolmates' adolescent wellbeing. Evidence from U.S. middle and high schools.

Silvia Palmaccio and Nicoletta Balbo*

Abstract

Creating an inclusive school environment, where students with disabilities are integrated as much as possible with students without disabilities, has become a central objective in educational policies worldwide. Despite this trend, however, empirical evidence on the effects of exposure to peers with disabilities remains limited. Using data from the National Longitudinal Study of Adolescent Health (Add Health), we examine child disability spillover effects on internalizing and externalizing behavioral outcomes of students in middle and high school (grades 7-12) in the United States. To address potential endogeneity, we employ a quasi-experimental research design and exploit within-school, between-grade variation in peer composition. Our results show that exposure to peers with physical disabilities is reflected in students without disabilities' increased internalizing problems, with no effects on externalizing problems. No spillover effects are found for learning disabilities. These results are consistent with the hypothesis that students without disabilities socialize the emotional and social challenges experienced by their peers with disabilities. We also find that the effects are substantially mitigated in schools where emotional counseling is provided, suggesting that emotional counseling and the factors influencing its provision may play a key role in promoting a healthier and more inclusive classroom environment for all students.

*Silvia Palmaccio (*corresponding author*): Bocconi University, Dondena Centre for Research on Social Dynamics and Public Policy (email: silvia.palmaccio@unibocconi.it); KU Leuven, Leuven Economics of Education Research; University of Turin. Nicoletta Balbo: Bocconi University, Dondena Centre for Research on Social Dynamics and Public Policy. For their helpful comments and suggestions, we would like to thank participants of the conferences of the Research Committee 28 on Social Stratification and Mobility, the Leuven Economics of Education Research, the Italian Association for Population Studies, the European Consortium for Sociological Research, as well as workshop participants at CEU Democracy Institute. This research uses data from Add Health, funded by grant P01 HD31921 (Harris) from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), with cooperative funding from 23 other federal agencies and foundations. Add Health is currently directed by Robert A. Hummer and funded by the National Institute on Aging cooperative agreements U01 AG071448 (Hummer) and U01AG071450 (Aiello and Hummer) at the University of North Carolina at Chapel Hill. Add Health was designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill. Silvia Palmaccio and Nicoletta Balbo acknowledge the financial support received by the European Union (ERC FRAILIFE—Child Disability and Family Life, G.A. 101077533) under the European Union's Horizon 2021-2027 research and innovation program. The authors declare that they have no relevant or material financial interests that relate to the research described in this article.

1 Introduction

Since the 1994 UNESCO Salamanca Declaration, education systems all over the world have been increasingly committed to adopting educational practices that are as inclusive as possible toward children with disabilities. In the United States, providing children with disabilities with "a free and appropriate public education in the least restrictive environment" is a right established by the Individuals with Disabilities Education Act (IDEA) in 1975. An inclusive school environment is also promoted in the European Union, where one of the pillars of social rights is to guarantee everyone the right to inclusive, quality education. Despite this trend toward inclusive education, and particularly toward the integration of children with disabilities into the same school environment as children without disabilities, we know surprisingly little about the effects of being exposed to child disability in school (Balestra, Eugster, and Liebert 2022).

In this paper, we examine how exposure to peers with disabilities in middle and high school affects internalizing and externalizing behavioral problems of students without disabilities. Earlier literature mostly focused on educational outcomes, generally finding that being exposed to peers with disabilities has negative effects on the schooling outcomes of students without disabilities (Balestra, Eugster, and Liebert 2022; Fletcher 2010; Kristoffersen et al. 2015; for contrasting findings, see Ruijs 2017). However, cognitive outcomes capture only a subset of the factors contributing to individual trajectories of well-being, social integration, and socioeconomic attainment (Heckman and Rubinstein 2001). To our knowledge, only two studies examined non-cognitive effects of exposure to classmates with disabilities, obtaining mixed findings (Gottfried 2014; Pan and Luo 2023). On the one hand, Gottfried (2014) showed increased behavioral issues (e.g., higher internalizing and externalizing problems, lower interpersonal skills) among kindergarteners and 1-st graders exposed to peers with disabilities in the US. On the other hand, Pan and Luo (2023) observed no effects on emotional, satisfactional, and social inclusion outcomes among students enrolled in middle school in China.

This paper contributes to this limited literature by providing the first evidence of the spillover effects of child disability on adolescent well-being outcomes among (middle and) high school students. We draw on data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), which is particularly well-suited for our purposes for two reasons. First, the dataset enables a within-school, across-cohort design that exploits idiosyncratic variation in the share of

peers with disabilities across grades within the same school. This design is possible because, on the one hand, the data provide information on whether sampled students receive special education and allow us to further reconstruct whether they have a physical or a learning disability. On the other hand, for each student in our sample, we can reconstruct the share of peers in their cohort with a (physical or learning) disability. The empirical strategy's underlying idea is that while students may select into schools, the proportion of students with disabilities they are exposed to naturally fluctuates across cohorts in ways that are plausibly exogenous to any individual student's outcomes. Since the seminal work by Hoxby (2000), this strategy has been commonly employed in the literature to estimate peer composition effects (for recent studies, see Lei 2022; Bifulco, Fletcher, and Ross 2011; Fletcher 2010; Adamopoulou and Kaya 2024), and we empirically validate the underlying identifying assumption through a series of tests. The second advantage of our dataset lies in that we can extend the analysis beyond cognitive outcomes and examine a wide range of adolescent well-being measures, namely indicators of internalizing problems (depressive symptoms, positive outlook, self-esteem) and externalizing problems (nonviolent delinquency, violent behavior, and trouble at school). These outcomes are critical dimensions of adolescent development and long-run wellbeing, complementing cognitive skills.

Our findings indicate that exposure to peers with physical disabilities significantly increases internalizing, but not externalizing, problems among students without disabilities. By contrast, exposure to peers with learning disabilities has no significant effects on any outcomes. These patterns align with what we term the emotional spillover hypothesis, which posits that the emotional and social challenges faced by students with physical disabilities—likely more visible and salient than those associated with learning disabilities—spill over to affect the internalizing outcomes of their peers without disabilities. We also find that these effects are driven by girls and are substantially mitigated in schools that provide on-site emotional counseling, suggesting that access to emotional support services may play a crucial role in fostering healthier and more inclusive environment for all students.

2 Theoretical mechanisms

How the exposure to peers with disabilities might affect students without disabilities' adolescent well-being is theoretically ambiguous, and we argue that there are three possible channels through

which exposure to student disability might affect students without disabilities' well-being.

The *bullying victimization hypothesis* (named by the authors) posits that exposure to a higher share of peers with a disability might trigger a more hostile classroom environment where students without disabilities experience both higher internalizing and externalizing behavioral problems. Earlier literature has shown that students with disabilities are subjected to bullying victimization more frequently than students without disabilities (Blake et al. 2012). In particular, in the U.S., rates of bullying victimization among students with disabilities are estimated to be 1 to 1.5 times higher than among students without disabilities (Blake et al. 2012). Such bullying most often occurs in the form of physical aggression (e.g., direct attacks, fighting, or damaging property) or verbal abuse (e.g., mocking, intimidation, threats of violence) (Rose, Monda-Amaya, and Espelage 2011). Because bullying perpetration has also been linked to broader patterns of violent and nonviolent delinquency (Sigfusdottir, Gudjonsson, and Sigurdsson 2010), exposure to a higher proportion of peers with disabilities may be reflected in an overall increase in externalizing problems among students without disabilities. At the same time, previous literature has shown that witnessing bullying results in greater anxiety and depression symptoms among bystanders, that is, students who are neither bullies nor victims (Midgett and Doumas 2019; Rivers et al. 2009). Thus, such an adverse environment might also affect students without disabilities who are not directly involved in bullying by increasing their internalizing problems. In sum, according to the bullying victimization perspective, students without disabilities will experience both higher internalizing and externalizing problems as a consequence of elicited bullying behavior.

On the other hand, the *prosocial hypothesis* (named by the authors) provides a different view, predicting that exposure to a higher share of peers with disability might rather elicit a more cooperative classroom environment which translates into lower internalizing and externalizing problems of students without disabilities. Previous literature has shown a higher frequency of prosocial behavior among family members–parents or siblings–directly exposed to a child's disability (Orm et al. 2022a; Orm et al. 2022b; Stainton and Besser 1998). Outside the family environment, contact with individuals with disabilities has been associated with more favorable attitudes toward disability (Kalyva and Agaliotis 2009), and, in an experimental setting, revealing a disability identity led to more prosocial behavior among participants (Colbert and Chan 2020). If similar mechanisms would operate within an educational setting, exposure to students with disabilities might create an altruistic and proactive environment in which students without disabilities may become more sen-

sitive to their peers' problems and more frequently assist their needs. Because prosocial behavior is associated with lower internalizing and externalizing problems (Memmott-Elison et al. 2020; Schwartz and Sendor 1999), this might in turn be reflected in lower rates of internalizing and externalizing behavioral problems among students without disabilities.

Finally, the *emotional spillover hypothesis* (named by the authors) predicts that exposure to peers with disabilities will lead to higher internalizing, but not externalizing, problems among students without disabilities, as a result of students without disabilities internalizing some of the emotional and social challenges faced by their peers with disabilities. In the medical literature, exposure to and frequent interactions with distressed patients have been shown to affect the emotional well-being of healthcare providers by increasing internalizing problems (for reviews, see Sorenson et al. 2016; Najjar et al. 2009). Although students without disabilities do not have caregiving roles toward students with disabilities and the type of interaction is expectedly less encompassing, research suggests that simply witnessing others' suffering—in the form, for example, of mental health difficulties or social exclusion—can heighten one's own psychological distress (Alho et al. 2025; Masten et al. 2010). Therefore, we hypothesize higher internalizing, but not externalizing, problems among students without disabilities. Moreover, we hypothesize that the spillover effects are likely to be strongest in cases of more severe and visible disabilities (such as physical disabilities) than in cases of less severe disabilities (such as learning disabilities).

3 Data

3.1 The Add Health dataset

We use data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), a U.S. longitudinal survey that followed a nationally representative sample of students attending grades 8–12 in the academic year 1994-1995 as they transitioned from adolescence into adulthood. The first survey wave (Wave I) included 80 high schools and 52 middle schools, where about 90,000 students who were present on the day of the interview completed a brief baseline questionnaire. From this pool of schools, a core sample of roughly 17 boys and 17 girls per grade was then randomly selected to complete a more extensive interview. This core sample was supplemented with oversamples of ethnic minority groups. Together, these groups formed the "In-Home" sam-

ple, which was subsequently reinterviewed in four follow-up waves: Wave II in 1996, Wave III in 2001–02 (when participants were ages 18–26), Wave IV in 2008–09 (ages 24–32), and Wave V in 2016–18 (ages 32–42).

For the present analysis, we reconstruct the share of peers with a (physical or learning) disability using the In-Home core sample, i.e., the one not subjected to oversampling. Then, we conduct the analyses on the full In-Home sample of students who do not report a disability.

3.2 Disability measures

For students taking the In-Home interview in Wave I, we construct two indicators for child disability status: one for learning disability and the other for physical disability. To construct the former, we use parents' answers to i) whether "During the past 12 months did [the child] receive any type of special education service" and ii) whether the child has "a specific learning disability, such as difficulties with attention, dyslexia, or some other reading, spelling, writing, or math disability". With this information, we construct a binary variable for learning disability status coded 1 if parents replied affirmatively to both questions, 0 otherwise.

To construct the indicator for physical disability status, we require once more that the child received special education in the academic year when the survey occurred. Additionally, we follow earlier literature (see Cheng and Udry 2002; Kahn and Halpern 2018) and construct a physical disability index using Wave I students' and parents' answers to questions on whether the focal child has any permanent physical conditions that (i) involve difficulty in the use of limbs, (ii) require equipment, (iii) require personal-care assistance, or (iv) involve blindness or deafness. Using this information, we construct a binary variable for physical disability status coded 1 if the student receives special education and reports any physical disability among those mentioned, 0 otherwise.

3.3 Outcome measures

We measure adolescent well-being by looking at two broad outcomes: internalizing and externalizing problems. Each outcome is composed of multiple dimensions, with each dimension measured via factor analysis of multiple survey items asked in Wave I (see Appendix A for the full list of survey items employed in the construction of each dimension). Following Hawkins, Amato, and

King (2007), we construct an internalizing problems index based on three dimensions: depressive symptoms, positive outlook, and low self-esteem. The depressive symptoms dimension is measured using seven question items capturing the frequency, in the week prior to the survey, of feeling lonely, sad, or depressed. The positive outlook dimension is measured using four question items that assess how often respondents felt happy or hopeful about the future over the same 1-week period. Finally, the low self-esteem dimension is measured using six question items that measure whether students believe they have many good qualities and feel proud of themselves.

To construct an externalizing problem index, we consider three dimensions: nonviolent delinquency, violent behavior, and trouble at school. The first two dimensions follow Hawkins, Amato, and King (2007), while the third—trouble at school—is an addition introduced in our study. The delinquency dimension is constructed using 10 question items capturing the frequency, in the 12 months prior to the survey, of engaging in forms of proto-criminal behavior such as painting graffiti, damaging property, shoplifting, or acting rowdy in public. The violent behavior dimension is measured using eight question items assessing the frequency, over the same 12-month period, of taking part in violent acts such as getting into (group) fights, injuring someone, or using/threatening to use a weapon. Finally, the trouble at school dimension is constructed from four items that capture how often, since the beginning of the academic year, students experienced difficulties getting along with teachers, getting along with peers, completing homework, or maintaining attention in class.

3.4 Control variables

We employ a rich set of control variables, all measured in Wave 1. At the individual level, we include binary indicators for respondent sex (1 = female, 0 = male) and birthplace (1 = U.S.-born, 0 otherwise), as well as dummy variables for ethnicity (White, Black, Hispanic, Asian, Other) and year of birth. To capture socioeconomic background, we generate dummies for maternal and paternal education, grouped into five categories: less than secondary education, secondary education, some college, college, and missing. We also control for family income in 1994; if missing, we impute income using the average income of the student body at the respondent's school and add a binary indicator for imputation. Finally, to account for family characteristics, we include discrete variables for the respondent's number of full siblings and birth order, and a binary

indicator capturing whether the respondent was living with both biological parents at the time of the survey.

4 Methodology

4.1 Empirical strategy

To examine peers with disabilities' spillovers, similar to previous studies (e.g., Bifulco et al. 2014; Fletcher et al. 2021), we exploit idiosyncratic variation in the student population by including school fixed effects. Put simply, we examine whether the outcomes for students without disabilities in cohorts with a higher proportion of peers with disabilities differ from the outcomes of students without disabilities in the same school but in a cohort with fewer peers with disabilities. The idea is that even though students select into schools, across grades there is a natural variation in the percentage of peers with disabilities enrolled. In practice, we estimate the following regression:

$$y_{igs} = \beta_0 + \beta_1 P^{ld}_{-igs} + + \beta_2 P^{pd}_{-igs} + \delta X_{igs} + \gamma_s + \mu_g + \varepsilon_{igs} \tag{1}$$

where y_{igs} indicates internalizing (depression symptoms, positive outlook, low self-esteem) and externalizing outcomes (nonviolent delinquency, violent behavior, trouble at school) for the student without any learning or physical disabilities i in grade g at school s. The terms γ and μ indicate school and grade fixed effects. The main variables of interest are P^{ld}_{-igs} and P^{pd}_{-igs} which identify the proportion of peers with a learning or a physical disability, respectively, attending the same school and grade as student i but excluding student i from the count (*leave-one-out mean*). $\mathbf{X_{igs}}$ defines a series of individual, family and socioeconomic control variables referring to students without disabilities (age, gender, parental education, number of siblings, family income, country of birth, race).

4.2 Sample characteristics and balancing tests

Our estimation strategy relies on the assumption that students with learning or physical disabilities do not sort based on a systematic pattern within the same school. In other words, while parents may select a school for their children based on average school characteristics, they should not

choose it based on the student cohort characteristics. This assumption is standard in the literature (see, e.g., Adamopoulou and Kaya 2024; Lei 2022; Bifulco, Fletcher, and Ross 2011). We assess its plausibility in our context using two complementary approaches.

First, we visually examine the evolution of the share of peers with learning or physical disabilities within schools. Figure 1 illustrates this by plotting cohort-level disability shares for 20 randomly selected schools. Shares are computed not as leave-one-out but rather as cohort averages that include student i in the count as well. If the distribution of students with disabilities is random across cohorts within the same schools, we should not be able to detect any systematic pattern in how these shares evolve within a given school. Consistent with this expectation, Figure 1 does not show any detectable trend for the evolution of neither the percentage of peers with a learning disabilities nor the percentage of peers with a physical disability, visually supporting the claim that these shares evolve quasi-randomly within schools.

< Figure 1 here >

Second, we conduct balancing tests to assess whether observable student characteristics predict the cohort-level disability shares. Specifically, we regress P^{ld}_{-igs} and P^{pd}_{-igs} on fourteen covariates capturing family income, sex, parental education, family size, birth order, family composition, country of birth, and race, while including school and grade fixed effects. The underlying idea is that if students with disabilities are randomly distributed across grades within a school, then, conditional on school fixed effects, individual characteristics should not systematically correlate with the cohort-level disability shares. Figure 2 reports the results when, in addition to school fixed effects, we also control for grade fixed effects and cohort-level covariates. Across specifications, only 3 coefficients (out of 28) are statistically significant, which is consistent with what might arise by chance. Moreover, F-tests for joint significance fail to reject the null hypothesis at the 5% level ($F^{ld} = 0.587$; $F^{pd} = 0.149$). Taken together, these findings support the plausibility of our identifying assumption.

< Figure 2 here >

5 Results

5.1 Spillover effects of child disability on adolescent well-being

In Table 2, we show the effects of being exposed to a higher share of peers with a learning or a physical disability on internalizing (columns 1 to 3) and externalizing (columns 4 to 6) problems of students without disabilities. To assess robustness, we estimate increasingly rich specifications. In columns (1) and (3), we show results obtained by conditioning only on school and grade fixed effects. We then augment the model with individual characteristics in columns (2) and (4), and finally, in our preferred specification, we add cohort-level variables in columns (5) and (6).

< Table 2 here >

Our results indicate that exposure to peers with disabilities has a significant impact on the well-being of students without disabilities, although the magnitude and direction of the effects vary depending on both the type of disability and the well-being dimension considered. In particular, we find no evidence that the presence of students with learning disabilities influences either internalizing or externalizing outcomes. By contrast, a greater exposure to peers with physical disabilities is associated with a statistically significant increase in internalizing problems among students without disabilities. These findings are robust across specifications. In our preferred specification (column 3), we estimate that a 1 percentage point (p.p.) increase in the share of peers with physical disabilities is associated with a 1.405% of a standard deviation increase in the overall internalizing problem index. This effect is non-negligible, given that the median grade cohort in our sample consists of 155 students, and thus the estimated magnitude corresponds to the presence of only about 1.5 additional students with a physical disability. No evidence of spillover effects is found for externalizing outcomes. Regarding the mechanisms that may account for our findings, the results are consistent with the emotional spillover hypothesis. Indeed, we find no spillover effects of either disability type on externalizing problems, while we do find a positive association between exposure to peers with a physical disability and higher internalizing problems among students without disability.

5.2 Heterogeneous analyses

In Table 3, we show the results from performing two heterogeneous analyses. All estimations are run by including the full set of covariates, as well as school and grade fixed effects. As a first heterogeneous analysis, in Panel A, we examine whether the spillover effects of being exposed to peers with a disability vary by student sex. Our results show that our main effects of Table 2 are entirely driven by girls. In column 3, a 1 p.p. increase in the share of peers with physical disability is associated with a 2.270% of a s.d. increase in internalizing problems among girls, whereas no significant spillover effects are found for boys. This is consistent with earlier literature consistently showing that women experience more empathy than men (Benenson, Gauthier, and Markovits 2021).

As a second analysis, in Panel B we examine whether our results vary depending on whether the school attended by the focal student provides emotional counseling. Specifically, we compare students in schools offering on-site emotional counseling (columns 3 and 4) with students in schools that either refer counseling to external providers or do not offer such services at all (columns 1 and 2). The availability of emotional counseling may mitigate the estimated effects on internalizing problems by enabling students to process emotional responses with trained professionals. However, because the presence of these services is likely correlated with broader school characteristics (e.g., resource availability or student body socioeconomic composition), we conduct our analyses on schools with a lower socioeconomic status student body, which could benefit the most from the provision of such services. To operationalize this restriction, we rank schools by the proportion of students with at least one college-educated parent and conduct the analysis on schools in the bottom half of the distribution.[1]

Our results show that the spillover effects of child physical disability are substantially mitigated and become non-significant in schools providing on-site emotional counseling. By contrast, such effects are highest in schools where such service is not provided, where 1 p.p. increase in the share of peers with physical disabilities is reflected in 2.750% of a s.d. increase in internalizing problems of students without disabilities. Although we cannot rule out that even in the examined schools serving students from lower socioeconomic backgrounds there might be selection into emotional counseling provision, these results are suggestive that emotional counseling and the fac-

[1] Results remain robust when limiting the sample to schools in the bottom tertile of the distribution.

tors leading to its provision may play a key role in mitigating the negative effects of child disability spillovers on students without disabilities' internalizing problems.

6 Conclusion

This paper contributes to the limited literature on spillover effects of peers with disabilities by examining the effects of being exposed to students with learning or physical disabilities on grademates' internalizing and externalizing outcomes. Our results suggest that exposure to students with physical disabilities increases internalizing problems among students without disabilities by raising depression symptoms, reducing positive outlook, and reducing self-esteem, but has no effect on externalizing problems. Further, we do not find any spillover effect of being exposed to peers with learning disabilities. These findings are consistent with what we term the emotional spillover hypothesis, positing that students without disabilities socialize the emotional and social challenges experienced by students with especially severe and visible disabilities. We also find that our main effects are driven by girls and are non-significant in schools where on-site emotional counseling is provided. From a policy perspective, our findings are suggestive that fostering emotional services may be an important instrument to ensure that all children can benefit from a healthier and more inclusive environment in the classroom.

Tables and Figures

Figure 1: Share of students with learning or physical disabilities in grades 7–12 in twenty randomly selected schools

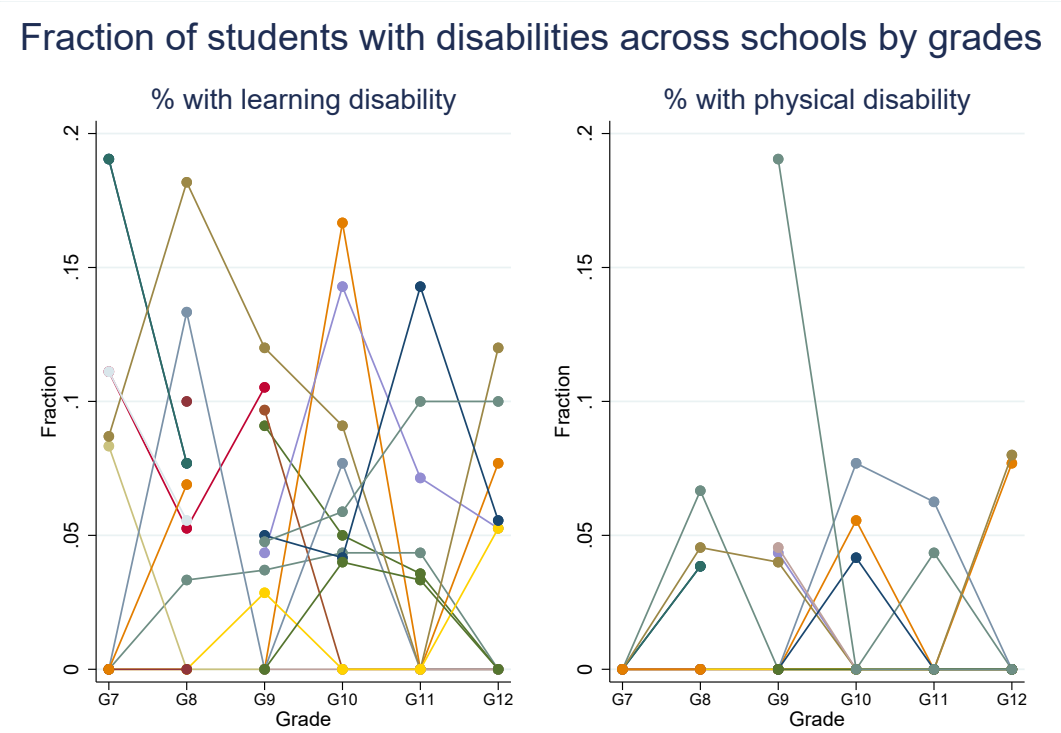
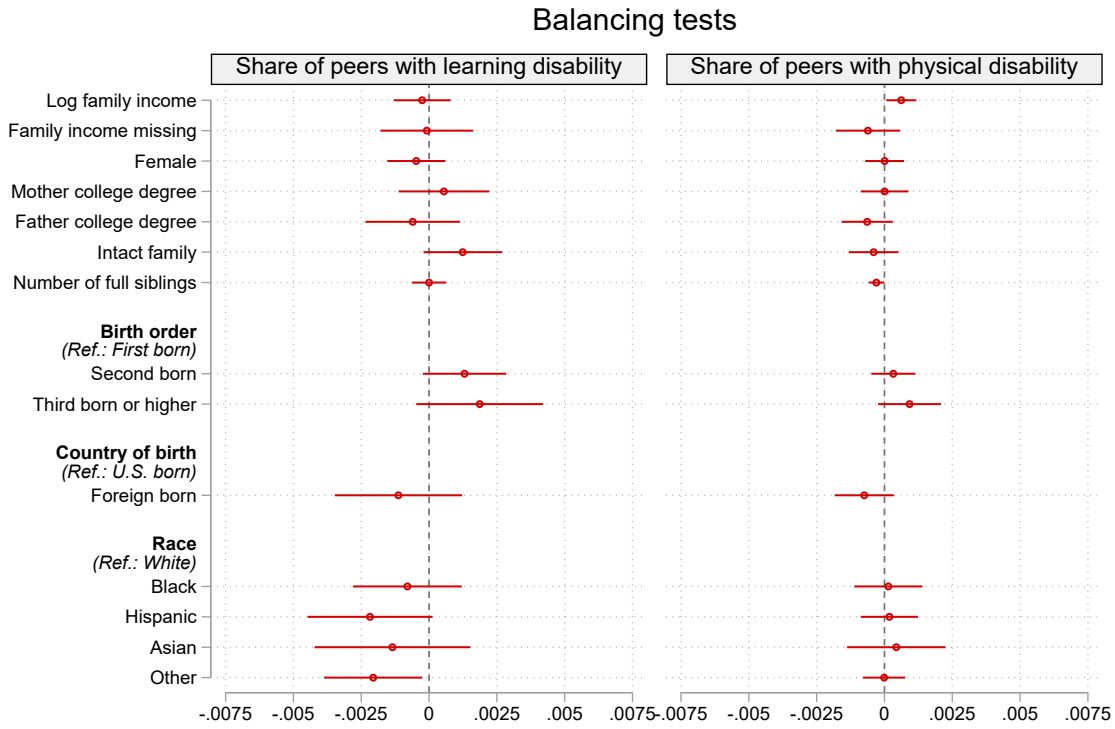


Figure 2: Balance tests



Notes: This figure shows the association between control variables and the key independent variables of interest (share of peers with learning and physical disabilities), with school and grade fixed effects as well as grade-level covariates controlled for.

Table 1: Descriptive statistics

	Mean	(SD)	N
Individual control variables			
Sex (1 is female)	0.516	(0.500)	15239
Family income	46.232	(48.082)	15239
Family income missing	0.142	(0.349)	15239
Number of siblings	2.579	(1.427)	15239
First born	0.51	(0.500)	15222
Second born	0.297	(0.457)	15222
Third or higher-order born	0.193	(0.395)	15222
Born in US	0.922	(0.269)	15239
Born outside US	0.078	(0.269)	15239
White	0.372	(0.483)	15239
Black	0.153	(0.36)	15239
Hispanic	0.072	(0.258)	15239
Asian	0.043	(0.202)	15239
Other ethnicity	0.361	(0.480)	15239
Mother no secondary education degree	0.147	(0.354)	15239
Mother secondary education degree	0.38	(0.485)	15239
Mother some college	0.126	(0.332)	15239
Mother college degree	0.261	(0.439)	15239
Mother education missing	0.086	(0.28)	15239
Father no secondary education degree	0.104	(0.305)	15239
Father secondary education degree	0.262	(0.44)	15239
Father some college	0.084	(0.278)	15239
Father college degree	0.224	(0.417)	15239
Father education missing	0.325	(0.469)	15239
Lives with biological mother and father	0.536	(0.499)	15239
Cohort control variables			
% peers Hispanic	11.004	(14.224)	14678
% peers White	50.262	(32.397)	14678
% peers Black	15.721	(20.952)	14678
% peers with at least one college-educated parent	36.95	(16)	14667
% peers born in US	89.869	(14.03)	14678
Outcome variables			
Internalizing problem index (total)	-0.051	(0.937)	15175
Depression symptoms	-0.043	(0.894)	15214
Positive outlook	0.04	(0.811)	15217
Low self-esteem	-0.032	(0.905)	15199
Externalizing problem index (total)	-0.022	(0.917)	14995
Nonviolent delinquency	-0.009	(0.897)	15087
Violent behavior	-0.034	(0.875)	15049
Trouble at school	-0.023	(0.786)	15233

Notes: The table reports the mean, standard deviation, and number of observations for each of our individual and grade-level control variables as well as for our outcome variable.

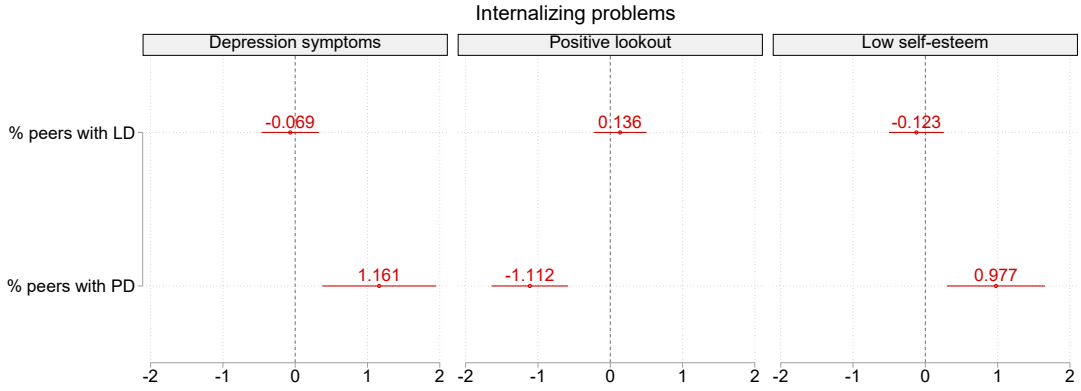
Table 2: Spillover effects of peers with learning and physical disabilities on students' adolescent wellbeing

	Internalizing problems			Externalizing problems		
	(1)	(2)	(3)	(4)	(5)	(6)
% Peers with learning dis.	-0.268	-0.238	-0.140	-0.096	-0.063	0.002
	(0.220)	(0.204)	(0.196)	(0.237)	(0.234)	(0.233)
% Peers with physical dis	1.320***	1.237**	1.405***	-0.224	-0.246	-0.271
	(0.387)	(0.380)	(0.387)	(0.337)	(0.316)	(0.329)
Individual controls	No	Yes	Yes	No	Yes	Yes
Cohort-level controls	No	No	Yes	No	No	Yes
Grade FE	Yes	Yes	Yes	Yes	Yes	Yes
School FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14864	14848	14439	14689	14674	14273
R^2	0.045	0.103	0.106	0.041	0.108	0.108

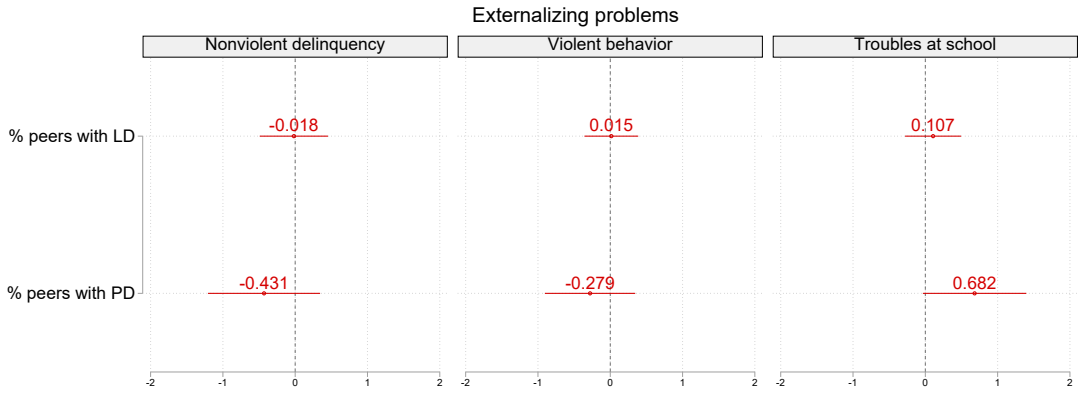
Notes: This table shows the effect of a higher share of peers with a learning or a physical disability on students without disabilities' internalizing and externalizing problems. The internalizing problems score is derived from a factor analysis of survey items capturing depression symptoms, positive outlook, and low self-esteem; the externalizing problems score from factor analysis of survey items capturing nonviolent delinquency, violent behavior, and trouble at school. Individual controls include birth year indicators, sex, mother's and father's education (in dummies), family income, an indicator for missing family income, nativity (born outside the U.S.), number of full siblings, race (in dummies), and whether the student lives with both parents. Cohort-level controls include share of peers Hispanic, share of peers White, share of peers Black, share of peers with at least one college-educated parent, share of peers born in the U.S., and average grade size. Standard errors, clustered at the school level, in parenthesis. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 3: Spillover effects of peers with learning and physical disabilities on students' adolescent wellbeing, by subdomains of internalizing and externalizing problems

(a)



(b)



Notes: This figure shows the effect of a higher share of peers with a learning or a physical disability on students without disabilities' internalizing and externalizing problems, , disaggregated by subdomain. Internalizing subdomains include depression symptoms, positive outlook, and low self-esteem; externalizing subdomains include nonviolent delinquency, violent behavior, and trouble at school. All regressions are estimated with the full set of individual and cohort-level controls, as well as school and grade fixed-effects.

Table 3: Spillover effects of peers with learning and physical disabilities on students' adolescent wellbeing, by sex and in-school emotional counseling provision

Panel A.	Boys		Girls	
	Internalizing problems (1)	Externalizing problems (2)	Internalizing problems (3)	Externalizing problems (4)
% Peers with learning dis.	-0.225	-0.521	-0.065	0.464
	(0.241)	(0.296)	(0.315)	(0.266)
% Peers with physical dis.	0.316	-0.498	2.270***	-0.228
	(0.453)	(0.476)	(0.643)	(0.494)
Additional controls	Yes	Yes	Yes	Yes
Grade FE	Yes	Yes	Yes	Yes
School FE	Yes	Yes	Yes	Yes
Observations	6989	6882	7450	7391
R^2	0.091	0.077	0.101	0.096
Panel B.	On-site emotional counseling: no		On-site emotional counseling: yes	
	Internalizing problems (1)	Externalizing problems (2)	Internalizing problems (3)	Externalizing problems (4)
% Peers with learning dis.	0.051	0.151	-0.572	-0.181
	(0.451)	(0.463)	(0.398)	(0.470)
% Peers with physical dis.	2.750***	0.710	0.598	-0.750
	(0.546)	(0.576)	(0.498)	(0.483)
Additional controls	Yes	Yes	Yes	Yes
Grade FE	Yes	Yes	Yes	Yes
School FE	Yes	Yes	Yes	Yes
Observations	2841	2789	4473	4418
R^2	0.115	0.134	0.111	0.113

Notes: This table shows the effect of a higher share of peers with a learning or a physical disability on students without disabilities' internalizing and externalizing problems, divided by sex (Panel A) and by whether the attended school provides emotional counseling (Panel B). Additional controls consist of all the individual and cohort-level covariates as defined in Table 2. Standard errors, clustered at the school level, in parenthesis. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Online Appendix

A Variable construction details

A. Internalizing problems

Depression symptoms (How often was the following true during the past week? 0 = never or rarely, 1 = sometimes, 2 = a lot of the time, 3 = most of the time or all of the time)

You were bothered by things that usually don't bother you.

You felt that you could not shake off the blues, even with help from your family and friends.

You felt depressed.

You thought your life had been a failure.

You felt lonely.

You felt sad.

You felt life was not worth living

Positive outlook (How often was the following true during the past week? 0 = never or rarely, 1 = sometimes, 2 = a lot of the time, 3 = most of the time or all of the time)

You felt that you were just as good as other people.

You felt hopeful about the future.

You were happy.

You enjoyed life.

Low self-esteem (Do you agree or disagree with the following statement? 1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, 5 = strongly disagree)

You have a lot of good qualities.

You have a lot to be proud of.

You like yourself just the way you are.

You feel like you are doing just about everything right.

You feel socially accepted.

You feel loved and wanted.

B. Externalizing problems

Nonviolent delinquency (In the past 12 months, how often did you... 0 = never, 1 = 1 or 2

times, 2 = 3 or 4 times, 3 = 5 or more times)

...paint graffiti or signs on someonse else's property or in a public space?

...deliberately damage property that didn't belong to you?

...lie to your parents or guardians about where you had been or whom you were with?

...take something from a store without paying for it?

...drive a car without its owner's permission?

...steal something worth more than $50?

...go into a house or building to steal something?

...sell marijuana or other drugs?

...steal something worth less than $50?

...act loud, rowdy, or unruly in a public place?

Violent behavior (In the past 12 months, how often did you... 0 = never, 1 = 1 or 2 times, 2 = 3 or 4 times, 3 = 5 or more times)

...get into a serious fight?

...hurt someone badly enough to need bandages or care from a doctor or a nurse?

...use or threaten to use a weapon to get something from someone?

...take part into a fight where a group of your friends was against another group?

...have a knife or gun pulled on you?

...get into a physical fight?

...get jumped?

...pull a knife or gun on someone?

Trouble at school (Since school started this year, how often have you had trouble... 0 = never, 1 = just a few times, 2 = about once a week, 3 = almost everyday, 4 = everyday)

...getting along with your teachers?

...paying attention in school?

...getting your homework done?

...getting along with other students?