Inclusive Teaching: Spotting Social Isolation in the Classroom *

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Abstract

We evaluate an intervention aimed at addressing social isolation in classrooms. The treatment provides teachers with their students' social networks and information on developmental risks associated with social exclusion. Using friendship data and incentive-compatible measures, we find that the intervention reduces social isolation and anti-social behavior but does not increase prosocial behavior. Lower antisocial behavior enhances economic efficiency, reflected in higher average student payoffs and reduced inequality. Our findings highlight the personal and communal benefits of addressing social exclusion and antisocial peer dynamics in schools.

Keywords: Social Isolation, Anti-social behavior, Social Networks.

JEL: I24, I28, C93

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1 Introduction

The social environment of a child plays a crucial role in their overall development. While schools are primarily learning institutions, they also serve as social hubs where students interact, play, learn from one another, and form lasting friendships. However, for some students, the social aspects of schooling can be burdensome due to antisocial behaviors from their peers. These behaviors, ranging from subtle exclusion to outright peer violence, can have profound and enduring negative effects on a child's development (Brown and Taylor, 2008; Carrell et al., 2018; Kiessling and Norris, 2023; Lacey et al., 2014; Qualter et al., 2010). Social isolation, often difficult for adults to detect, can lead to serious issues for children and adolescents, including low self-esteem, a diminished sense of belonging, chronic expectations of rejection, and even suicidal thoughts (Ayduk et al., 2001; Downey and Feldman, 1996; Leigh-Hunt et al., 2017; Maes et al., 2019; Mendoza-Denton et al., 2002). High-quality, enjoyable learning experiences are compromised in classrooms where some students feel lonely, unwanted, bullied, or excluded. Indeed, research in medical and social psychology indicates that loneliness is associated with poor academic performance and unhealthy behaviors, both of which negatively impact learning and may lead students to disengage from education (Buhs et al., 2006; Jefferson et al., 2023). Thus, it is essential to create cohesive and supportive school environments where social isolation and segregation based on any characteristics are promptly spotted and addressed.

This study examines the potential for teachers to address and ameliorate socialization issues among their students. We evaluate the effectiveness of an intervention designed to highlight social isolation by providing teachers with detailed maps of the friendship networks in their classrooms. Alongside this feedback, teachers receive information on the detrimental effects of social exclusion on children's cognitive and socioemotional development, as well as its long-term consequences. The intervention emphasizes the critical role of teachers in fostering an inclusive classroom environment. It offers practical strategies for promoting social integration, such as using random group assignments for class activities or assigning isolated students tasks typically reserved for the most popular or outgoing children. The overarching objective of the intervention is to enhance social integration and create an inclusive social environment in schools.

The study was conducted across 46 public primary schools in three regions of Italy, in-

cluding over 2,200 students and 239 teachers. We collected baseline data in the school year 2021-2022 to create friendship network maps for each classroom to share with the respective teachers. In November 2022, teachers in the 22 treatment schools were invited to an online meeting. The session emphasized the crucial role teachers play in shaping children's social skills and relationships. We revealed that the actual prevalence of social exclusion was significantly higher than the teachers' perceptions and highlighted that isolation was particularly prevalent among children from low socio-economic status or with migrant backgrounds. We also showed that social exclusion was positively correlated with poor mental health status and a negative perception of the school environment. After the meeting, we distributed personalized classroom reports to all teachers in the treatment schools and invited them to join WhatsApp groups to monitor the implementation. Our hypothesis is that by providing teachers with information on social exclusion patterns in their classrooms and emphasizing their ability to address these issues through simple actions, we can reduce antisocial behavior toward vulnerable children and alleviate social exclusion. To test this hypothesis, we collected endline data in May 2023.

We collected a set of indicators that characterize the classroom's relational climate both at baseline and endline. We elicit classroom social networks by asking children to nominate classmates as their best friends and used these data to construct measures of social exclusion, which serve as our primary outcomes. Additionally, we developed an incentivized game to measure antisocial behavior toward peers. The game involves a tournament with an anonymous classmate, followed by a decision on whether to sabotage the classmate's performance to gain an unfair advantage. The sabotage, in this context, involves canceling the opponent's earned output, allowing us to measure economic waste and inequality resulting from antisocial acts within the classroom. To measure prosocial behavior, we implemented a cooperation game and a dictator game. Finally, we implemented item-response questionnaires to evaluate children's mental health, their sense of belonging to school, and their perception of teachers.

We first document that children with lower socioeconomic status and immigrant background are more likely to be socially isolated in the classroom. Social isolation is also associated with lower mental well-being and student's sense of belonging to school, and negatively correlated with academic achievement in our data. Against this background, we find that the treatment reduced social isolation in the classroom. Treated students were 1.5 percentage points less likely to report having "no friends in the classroom," representing a 50% effect relative to the control group. Moreover, treated students received significantly more

nominations as friends from classmates, indicating improved inclusivity in the classroom. Specifically, the number of nominations children made and the number of times a child was nominated as a friend increased significantly, compared to the control group.

We also find that the treatment significantly reduced antisocial behavior, measured by our sabotage game: children in treated schools were 7 percentage points less likely to sabotage their opponents' performance, representing a 10% reduction relative to the control group. While we estimate null effects on prosocial behavior, we detect some modest improvement, albeit statistically weak, in children's mental health, sense of belonging, and perception of teachers. Much of the positive impact appears to be driven by students who were socially isolated at baseline and those from lower socioeconomic backgrounds. We suggest that the treatment achieved these positive outcomes by encouraging teachers to adopt more inclusive practices in the classroom. Supporting this interpretation, treated teachers were more likely than control teachers to organize class activities in mixed-ability groups.

We designed our sabotage game to causally demonstrate that antisocial behavior has economic implications for communities. Leveraging the features of our incentivized game, we treat each classroom as a community whose members engage in a competitive output production task. To illustrate the link between antisocial behavior and economic well-being, we simulated payoffs using the empirical distribution of output and sabotage (economic waste) decisions and constructed classroom-level economic aggregates: per-capita payoffs, minimum and maximum payoffs, and the Gini coefficient. We show that treated classrooms achieved higher per-capita payoffs, indicating lower economic waste from sabotage behavior. They also achieved significantly higher minimum payoffs and significantly lower payoff inequality compared to the control classrooms.

Our study makes two key contributions. First, while the detrimental effects of social isolation on children and adolescents are widely acknowledged in social psychology and medical research, limited attention has been devoted in developing policy-relevant interventions to minimize social exclusion in classrooms. To the best of our knowledge, our is the first study to directly target this issue and show that revealing the extent of social isolation to teachers—coupled with information on its risks and prevention strategies—can effectively reduce both social isolation and antisocial behavior. The intervention is cost-effective with 21 US dollars per student and compares favorably to similar school-based interventions that target student behavior (Hunter et al., 2018; Sorrenti et al., 2024). Second, we developed an innovative measure of antisocial behavior through an incentivized game, which allows us to assess the economic cost of such behavior for a community. Through this simple simulation

exercise and the randomized implementation of the intervention, we provide causal evidence that complements the existing literature on the relationship between social cohesion and economic well-being(Alesina and La Ferrara, 2005; Easterly et al., 2006).

Our paper contributes to several strands of literature. First, we add to the small but growing body of work on the significance of schools' social climate for children's cognitive and socioemotional development (Alan et al., 2021; Alan and Kubilay, 2023; Shinde et al., 2018, 2020; Sorrenti et al., 2024). By documenting that classroom climate can be influenced by teachers' awareness, we complement this literature. Second, we engage with the recent research showing that socioemotional skills can be nurtured within the school environment (Alan et al., 2021; Alan and Ertac, 2018; Alan et al., 2019; Cappelen et al., 2020; Deming, 2009; Kosse et al., 2020; Sorrenti et al., 2024). Third, our paper relates to studies on the role of teachers in shaping children's beliefs and attitudes, ultimately influencing their socioemotional development. Some of these studies focus on how gender stereotypes of teachers impact children's outcomes and gender beliefs (Carlana, 2019), while others examine the implications of ethnic stereotypes (Alan et al., 2023; Alesina et al., 2024). By showing that teacher practices play a crucial role in shaping children's beliefs and attitudes, we contribute to this literature (Gradstein and Justman, 2002). Finally, we contribute to the broader literature on group cohesion and economic prosperity by emphasizing the communal implications of antisocial behavior. Our findings underscore the importance of maintaining group cohesion to achieve economic and social benefits (Alesina and La Ferrara, 2005; Easterly et al., 2006; Gächter et al., 2023).

2 Evaluation Design

2.1 Context and the Timeline of the Study

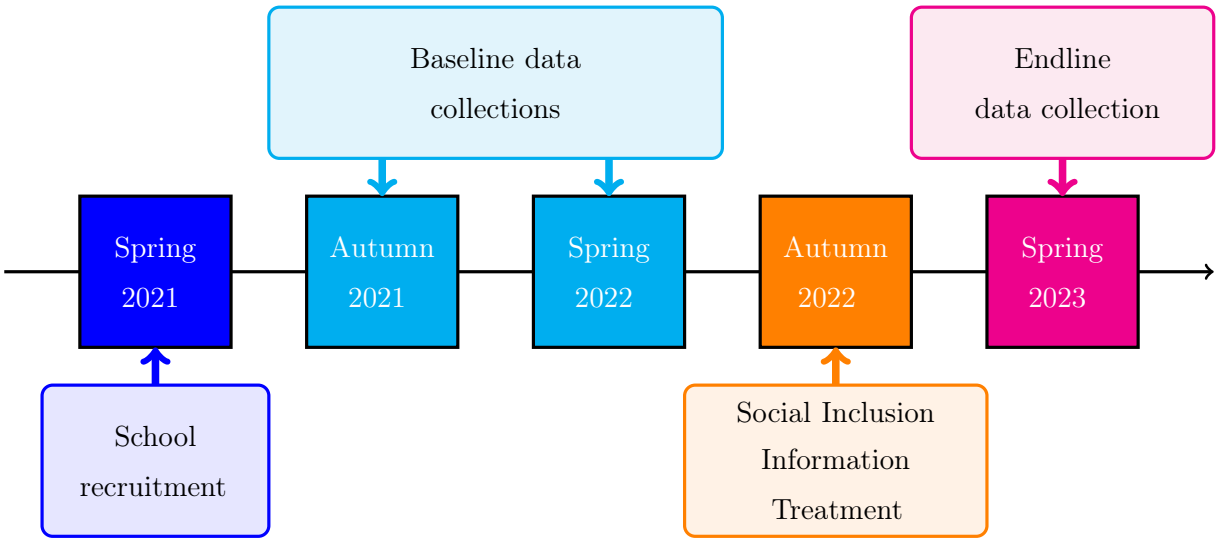
The study was conducted in a sample of Italian elementary schools during the 2022-23 academic year, targeting grade 3 students. Italy provides an ideal context for this research for two reasons. First, the Italian educational system places relatively little emphasis on providing an inclusive learning environment for students. Second, students are generally assigned to classes in grade 1 and remain with the same group of peers and teachers until the end of elementary school in grade 5. Each class may have one or two main teachers responsible for all subjects. This continuity allows teachers to become well acquainted with their students, making it easier to address socialization issues within the classroom.

The intervention was implemented as a clustered randomized control trial (RCT) during

the 2022-2023 academic year, with each school as the cluster unit. The sample includes 46 schools across three regions in the North and Center of Italy (Lombardy, Piedmont, and Lazio), comprising 135 classrooms, 239 teachers, and over 2,500 officially registered students. All schools in our sample initially participated in a training program offered to teachers during the 2021-22 school year, focusing on socio-emotional skills (Development of Social Skills – DeSS) implemented by Professor Zanetti's team at the University of Pavia. Out of 53 DeSS schools, 46 of them chose to participate in our intervention. The randomization for our intervention was conducted at the beginning of the 2022-23 school year, after the DeSS training was completed.

The timeline of the study is as follows: baseline data were collected in October-November 2021, with additional initial information gathered in Spring 2022. The intervention was rolled out from November 2022 to February 2023. Endline data were collected in May 2023. The detailed timeline is presented in Figure 1. Data collection was conducted in person by the research team, with assistance from trained research assistants. Teachers were generally present in the classroom during data collection, but were not involved in the process. We spent two lecture hours in each classroom at baseline (one hour at the beginning and one hour at the end of grade 2) and one hour at endline.

Figure 1: Timeline of the Study



2.2 Nature of the Intervention

The intervention implemented in this study is an information treatment with two components. The core component involves providing each teacher with a personalized report, that includes a detailed map of the friendship network within their classroom. To generate these maps, each child was asked at baseline in grade 2 to discreetly nominate up to three close friends from their classroom. Using these data, we created friendship network maps for each treatment class, which were then shared with the respective teachers in their personalized reports. These reports also contained statistics on social isolation among their students, highlighting the percentage of children who were not nominated as friends by any classmates and those who did not nominate anyone themselves. Additionally, we provided information on how social isolation varied according to parental socio-economic status and immigrant background.

The second component involves offering general information on the negative effects of social isolation and the importance of preventing it. This included neuroscientific evidence on the impact of social exclusion on the brain (Eisenberger et al., 2003), highlighting that persistent social exclusion can have lifelong effects, with profound negative consequences for an individual's choices and outcomes. We also presented evidence on the correlation between social isolation and children's mental health (Leigh-Hunt et al., 2017). This information was included in the personalized teacher reports and discussed in an online meeting. During this meeting, teachers were also asked about their perceptions of social isolation in their classrooms, and we demonstrated that the actual prevalence was significantly higher than the teachers' perceived prevalence. A generic classroom network map was shown to help teachers interpret these maps accurately. Finally, we encouraged teachers to take proactive steps to prevent persistent social isolation in their classrooms in subtle ways that avoid stigmatization. We provided practical tips, both in the report and in the online meeting, to promote social inclusion, based on the works of Juvonen et al. (2019) and Nagy and Paschke (2022). For example, we suggested that teachers mix students during group activities and remain vigilant for signs of subtle social exclusion, particularly among vulnerable students.

All teachers in the treatment group received their personalized reports and teachers in 19 out of 22 treatment schools attended the online meeting, representing 60% of all treatment teachers. To monitor the intervention's progress, we created WhatsApp groups with the treatment teachers, encouraging them to share successful activities with the research team. Online Appendix B presents a summary of the intervention report with generic examples

and the content of the online meeting.[1]

3 Measurement and Data

3.1 Descriptive Statistics and Balance

We collected comprehensive baseline data, including demographic information, fluid cognitive ability using Raven's Progressive Matrices (Raven et al., 2004), friendship network data, and measures of prosocial behavior through incentivized cooperation and dictator games. Additionally, we collected data on teacher characteristics (e.g., years of experience, education), emotional intelligence using the "Reading the Mind in the Eyes Test" (Baron-Cohen et al., 2001) and self-reported inclusive teaching practices. Detailed information on our measurement inventory is provided in Appendix C. We matched the data we collected with administrative data from the Italian Ministry of Education and INVALSI, which include baseline test scores from grade 2, as well as information on gender, and immigration background.

Approximately 15% of students in our sample have an immigrant background, and around one-third have parents with a university degree. The average class size is 19 students. Most of the teachers in our sample are female (98%); 83% hold tenured contracts; they are, on average, 50 years old, with an average of 19 years of teaching experience. Appendix Table A.1 presents the balance of baseline characteristics across treatment and control groups, including student demographics (Panel A), baseline network measures (Panels B and C), socioemotional and cognitive measures (Panels D and E), classroom and teacher characteristics (Panels F and G). Overall, the randomization was successful; out of 32 tests, only one significant difference was detected at the 5% level (for teachers' eye test).

Notably, social isolation is present in our classrooms: approximately 15% of students are socially isolated, meaning that they either stated that they did not have any friend in their classroom or were not nominated as a friend by any of their classmates. However, this high average conceals significant heterogeneity: 31% of immigrant students and 17% of students from low socio-economic backgrounds are socially isolated, compared to 13% of native students and 11% of students from higher socio-economic backgrounds. Additionally, our data corroborate existing evidence that socially isolated children have significantly more negative outcomes in various domains than those who are socially connected. Using our

[1]The full intervention package is available upon request.

baseline data, Table 1 presents the correlates of social isolation in the classroom. Socially isolated children have substantially lower mental health and are less likely to feel a sense of belonging at school. Moreover, there is a strong negative correlation between social isolation and academic ability. These baseline findings were instrumental in bringing this overlooked issue to teachers' attention and reinforcing the objectives of our intervention, as discussed in Section 2.2.

Table 1: Correlation between social isolation and students' characteristics at baseline

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Immigrant	0.186***						
	(0.028)						
Both parents have no university degree		0.056***					
		(0.016)					
Mental well-being			-0.040***				
			(0.008)				
Sense of belonging				-0.042***			
				(0.009)			
Perceived teacher behaviour					-0.007		
					(0.007)		
Std. Test Score Math						-0.040***	
						(0.008)	
Std. Test Score Italian							-0.045***
							(0.008)
Constant	0.125***	0.112***	0.150***	0.151***	0.152***	0.139***	0.137***
	(0.008)	(0.011)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Observations	2176	2009	2173	2175	2175	1922	1947
Raw Correlation	0.181	0.077	0.113	0.114	0.019	0.109	0.131

Notes: The table reports the coefficients from a uni-variate OLS regression of social isolation on respective outcome, all measured at baseline. The social isolation variable is a dummy which takes the value 1 if the student does not nominate a friend or is not nominated by any classmate in the classroom (total-degree isolation). Robust standard errors are in parentheses and raw correlations are presented at the bottom of the table.

In the next section, we discuss our outcomes of interest, including a detailed account of the incentivized game we designed to measure antisocial behavior.

3.2 Outcomes

We expect the intervention to influence the way children interact with each other. Given its focus, our primary outcomes center on social isolation and measures of social inclusion. Greater inclusivity may reduce antisocial interactions and/or promote prosocial interactions. Ultimately, stronger social connections within the classroom could enhance students' socio-emotional well-being. To test this hypothesized theory of change, we collected extensive endline data by visiting each classroom in person and spending a lecture hours in each. We detail our outcomes below:

Social Networks. We collected friendship network data to assess social isolation and inclusion. Children were asked to nominate up to three classmates as their best friends in the classroom. It was made clear that they could choose not to nominate anyone if they felt they had no friends in the classroom or could nominate one, two, or three classmates as their best friends. From these nominations, we constructed measures of out-degree and in-degree ties, defined as the number of nominations a student gives and receives, respectively. We report results on: (1) binary measures of out-degree and in-degree ties, indicating whether the child nominates (out-degree) or is nominated (in-degree) by at least one classmate as a best friend. We reversed these measures to reflect social isolation; and (2) normalized continuous out- and in-degree ties that account for class size (measures of social inclusion).[2] We hypothesize that the intervention will reduce the prevalence of social isolation, thereby improve social inclusion in the classroom.

Antisocial Behavior: Sabotage Game. We designed a novel incentivized game to measure antisocial behavior among children. The game involves a tournament to earn gift tokens, by allowing children to engage in costly sabotage behavior to gain unfair advantage against their opponent. Specifically, pairs of children are randomly formed and anonymously compete in a mathematical task. The player who answers the most questions correctly in two minutes receives one gift token per correct answer, while their opponent receives zero tokens, regardless of their own performance. Tokens can later be exchanged for small gifts, such as toys and colorful stationery items, which are valuable to children of this age. After the competition, before learning their performance outcome, all students receive five bonus tokens (endowment). They can use these tokens to sabotage their opponent by canceling correct answers, at a cost of one bonus token per cancellation. Each player can cancel up to five of their opponent's correct answers, thereby increasing their own chances of winning

[2]We divide the continuous measures of in-degree and out-degree ties by the total number of nodes minus one (Badham, 2013; Azzimonti and Fernandes, 2023).

the tournament.

The experimenter provided several examples and asked questions to ensure that children understood the implications of their decisions, including the option of not canceling any answers. The exact wording of the question is: "How many correct answers from your partner do you want to delete?" Following this, they were asked a question with an ethnic twist: "The classmate you are paired with could be someone whose parents are not Italian. How many correct answers from your partner do you want to delete? Indicate your choice on the tablet." We explained that only one of these questions would be used to determine their final payment.[3]

We define antisocial behavior as the propensity to engage in sabotage behavior. To measure this, we construct a binary variable indicating whether a student cancels an opponent's correct answers, and a continuous variable using the fraction of their sabotage endowment used. We designed this game to quantify the economic waste caused by antisocial behavior. In this context, economic waste in the classroom is represented by the total number of canceled correct answers. We assess the intervention's effect on economic waste using familiar economic aggregates considering the classroom as a community. This approach allows us to demonstrate the causal impact of antisocial behavior on economic well-being and inequality within a group.

Prosocial Behavior: Cooperation and Dictator Games. Our cooperation game, a version of a one-shot prisoner's dilemma, involves two participants being anonymously paired. We designed this game so that both participants are endowed with three tokens and must choose a card simultaneously—either green or orange. The payoff depends on both participants' choices. If both choose orange, each retains their initial endowment of three tokens. If they choose different colors, the player who chooses orange triples their tokens to nine, while their partner loses all their tokens. If both choose green, they double their endowments to six tokens. The cooperative action is to choose the green card.

After playing the cooperation game, we implemented a simple donation (dictator) game. For this, students were given four tokens and asked whether they would like to donate any of their tokens to an anonymous child from another school we did not visit so they did not have a chance to get gifts from us. Our outcomes in this game are the probability of donation and the fraction of endowment donated. We expect the treatment to increase the likelihood of cooperation and donation.

Social and Emotional Well-being. We assessed children's social and emotional well-

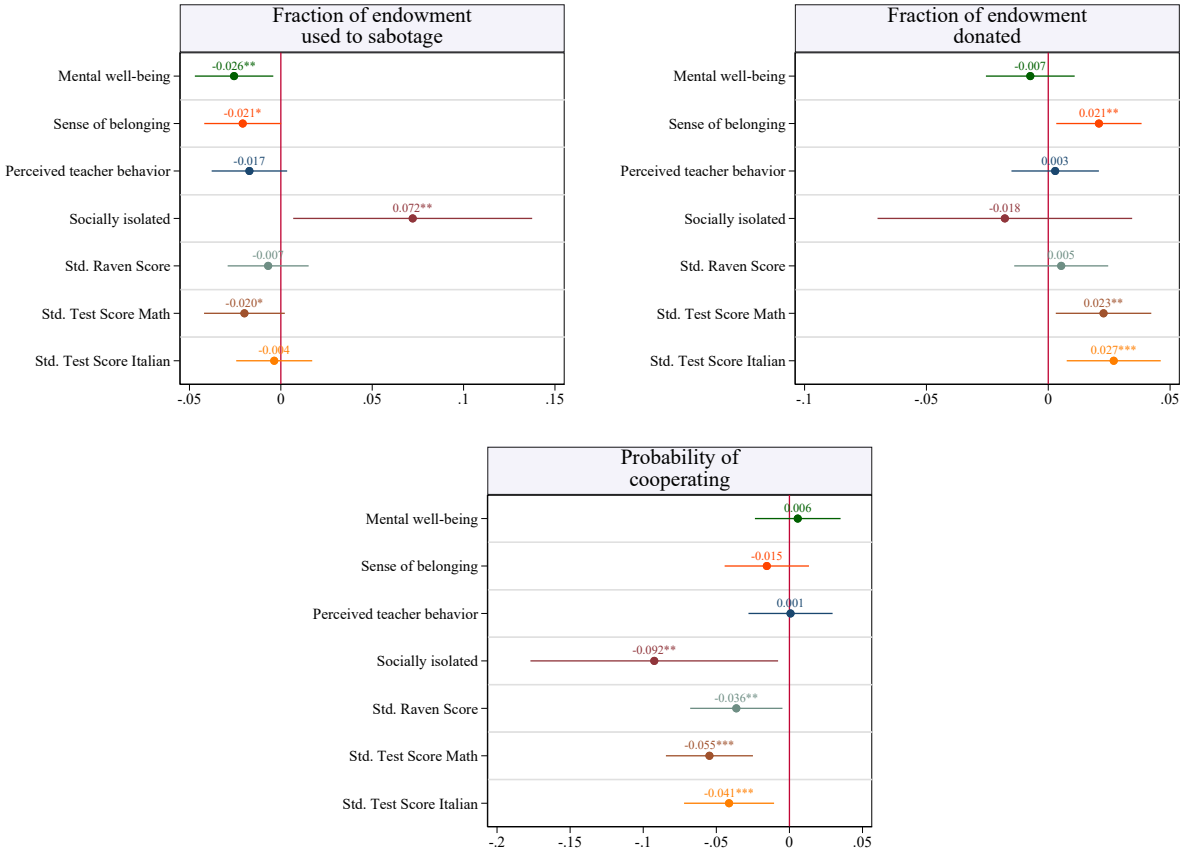
[3]The verbatim instructions are available here: `http://michelacarlana.com/wp-content/uploads/2024/11/ExperimentalInstructions.pdf`.

being through a series of item-response questions. These items were aggregated to measure various dimensions of well-being, specifically mental well-being, sense of belonging at school, and perceived support from math and Italian teachers. We constructed standardized indices for each of these outcome domains, as well as on their overall average. The survey instruments used at baseline and endline are detailed in Appendix Table C.1.

We explore the predictive validity of decisions made in our incentived games within our context. Figure 2 shows the correlations of these decisions with various indicators of social and emotional well-being. Overall, the decisions in these games capture a range of relevant attributes in children. For example, the sabotage decision is highly predictive of lower mental health, lower sense of belonging, negative perception of teachers and social isolation, while not correlated with fluid IQ (Raven score). Similarly, donating is highly correlated with the sense of belonging and with the standardized test scores. The cooperation game has very little predictive validity on indicators of social and emotional well-being relative to the other two games. Choosing the cooperative action is negatively correlated with fluid IQ as in Alan et al. (2021) and with the performance in the standardized test score.

Our hypothesis is that the intervention will reduce antisocial behavior, as measured by sabotage decision in the tournament, and improve prosociality, as measured by decisions in the cooperation and donation games. We acknowledge that neither of the games captures all aspects of the constructs we aim to describe. In the case of sabotage game for example, we aim to capture an aspect of antisocial behavior that involves being insensitive to a friend's effort for own advantage. There are many different forms of antisocial behavior ranging from being insensitive to someone's emotional states to verbal or physical abuse and more. Similarly, there are many forms of prosocial behavior other than cooperation and willingness to donate. Nevertheless, as suggested by the experimental literature and correlations we present in Figure 2, these measures are informative about one's social and emotional health and cognitive capacity, albeit imperfectly (Alan and Kubilay, 2024; Bhat et al., 2022; Krupka and Weber, 2013; Haushofer et al., 2023).

Figure 2: Predictive validity of the incentivized measures of pro and anti social behavior



Notes: The figure depicts the predictive power of sabotage, cooperation and donation games, using Raven's scores, standardized test scores, social isolation, mental well-being, sense of belonging, and perception of teacher indices. The sample includes students surveyed at endline and part of the control group. The first panel presents correlations for the fraction of endowment used to sabotage the opponent, the second panel presents correlations for the donation decision, and the third panel presents the correlations for the cooperative decision. Estimates are obtained by regressing the respective decision on each variable shown. 95% confidence intervals are obtained via robust inference.

4 Results

4.1 Empirical Strategy

We estimate the effect of the intervention on outcomes of interest by conditioning on baseline covariates and randomization strata fixed effects using the following model:

$$y_{ics} = \alpha_0 + \alpha_1 T_s + X'_{ics}\beta + Z'_{cs}\gamma + \delta_j + e_{ics} \quad (1)$$

where y_{ics} is the outcome for individual i, in classroom c and in school s. T_s is a binary indicator that defines the treatment status, equal to 1 if school s belongs to the treatment

group and 0 otherwise. X'_{ics} is a vector of controls for student i, which includes the outcome variable at baseline when available, age, gender, migrant status, Raven's score measured at baseline, parents' education levels, national standardized test scores (INVALSI), and binary indicators for children with learning difficulties, children who were absent at baseline or joined the school in grade 3. Z'_{cs} is a vector of class-level controls, including class size, the share of migrants in the class, teachers' characteristics (e.g., years of experience, level of education, Eyes Test Score, and binary indicators for full-time and fixed-term contracts).

δ_j represents strata fixed effects, which account for (i) participation in the DeSS treatment in the first or second round, and (ii) geographic area (North vs. Center regions). Standard errors are clustered at the school level, which is the unit of randomization. We also provide wild bootstrapped p-values to account for the small number of clusters (Cameron et al., 2008). Given imperfect compliance by teachers, the parameter of interest α_1 should be interpreted as the Intent-to-Treat (ITT) effect.

For robustness, in Appendix Figure A.2, we also report results using a basic set of controls, including strata and experimenter fixed effects, class size, and the share of migrant students. Since not all children present at baseline were available at endline during our classroom visits, Appendix Figure A.3 presents results using inverse probability weights to account for endline attrition, which is independent of treatment status (p-value=0.986), as shown in Appendix Table A.2.

4.2 Treatment effects on Social Isolation and Social Inclusion

We begin by investigating whether the intervention had any impact on the socialization structure in the classroom. Columns 1 to 3 of Table 2 present the estimated treatment effect on social isolation. Column 1 presents the results for out-degree centrality, where social isolation is measured by whether a student chose the option "I have no friends in the classroom." Column 2 shows in-degree centrality, which reflects whether a student was not nominated by any classmates. Column 3 combines both out-degree and in-degree measures into a total degree centrality, indicating if a student was isolated in either dimension. The last three columns present the effects of the intervention on social inclusion by examining the number of friendship links each student has, using out, in, and total degree measures. Social inclusion measures are standardized to have a mean of zero and a standard deviation of one for the control group, so the effects are reported in standard deviation units.

In the control group, 3% of untreated children did not nominate any classmates as friends, and about 13% did not receive any nominations. The intervention resulted in a 1.5 percentage

point reduction in out-degree isolation, which implies a 50% relative effect. The estimated effects on in-degree and total-degree isolation are smaller—10% and 15% relative effects, respectively—and do not reach statistical significance at conventional levels. The positive impact of the intervention on the classroom network structure is further reflected in the measures of social inclusion. We observe statistically significant increases in all metrics: a 0.11 and 0.08 standard deviation increase in, respectively, normalized out-degree ties and in-degree ties and a 0.11 standard deviation increase in total-degree ties, which corresponds to an increase of 0.19 in and out degree ties in a class of 20 students.

These results indicate that the intervention effectively reduced social isolation and increased friendship ties within the classroom.

Table 2: Treatment Effects on Social Isolation and Inclusion

	Social Isolation			Social Inclusion		
	(1) Out-Degree Binary	(2) In-Degree Binary	(3) Total-Degree Binary	(4) Out-Degree Continuous	(5) In-Degree Continuous	(6) Total-Degree Continuous
Treatment	-0.015*	-0.013	-0.022	0.114*	0.079**	0.107**
	(0.008)	(0.013)	(0.015)	(0.059)	(0.034)	(0.049)
Control Mean	0.03	0.13	0.15	-0.00	0.00	0.00
Observations	2218	2218	2218	2219	2219	2219
Wild bootstrapped p-values	0.070	0.386	0.208	0.102	0.060	0.058

Notes: The table reports the estimated treatment effects on social isolation and social inclusion. Dependent variables in columns 1 and 2 are binary indicators equal to one if, respectively, the Out-Degree and In-Degree are equal to 0. The dependent variable in column 3 is a binary indicator that takes value 1 if at least one of Out-Degree and In-Degree is equal to 0. Dependent variables in columns 4 to 6 are, respectively, the normalized number of Out-Degree ties, In-Degree ties, and Total-Degree ties (In-Degree + Out-Degree) standardized relative to the control group. Regressions (OLS) include strata fixed effects (FE), enumerator FE, the value of the outcome collected at baseline, the share of immigrants in the class, Raven's score, standardized test scores, gender, immigrant status, parental education, age in months, binary variables identifying students with a reported disability or learning disorder, students who were not autonomous during the survey data collection, students with a special teacher support, students who were absent at baseline or new in the school at endline, class size, binary indicators identifying whether the teacher is a math, Italian, or other subject teacher, as well as their gender, age, years of experience, level of education, eye test score, and binary indicators for holding a full-time or fixed-term contract. Standard errors are in parentheses and clustered at the school level (unit of randomization). The last row reports wild cluster bootstrap p-values calculated following Cameron et al. (2008).

4.3 Treatment effects on antisocial and prosocial behaviors

It appears that the intervention was effective in reducing social isolation and increasing friendship ties in the classroom. Our next question is whether this success is accompanied by a reduction in antisocial behavior and/or improvement in prosocial behavior among treated children. Columns 1 and 2 of Table 3 present the estimated treatment effects on the decisions

in the sabotage game. In the control group, 71% of children engaged in sabotage behavior, meaning that they canceled at least one correct answer of their opponent. They used 35% of their sabotage endowment, resulting in, on average, approximately 1.75 correct answers canceled. Compared to the control group, the intervention led to a 7.6 percentage point reduction in the likelihood of canceling an opponent's correct answers, which represents an 11% relative treatment effect, and is statistically significant at the 1% level. Additionally, treated students used about 11% less of their sabotage endowment to cancel correct answers. Similar patterns are observed in the version of the game where children were informed that their opponent might have foreign-born parents. The estimated treatment effects are not statistically different from each other (see Appendix Table A.3).

In terms of prosocial behavior, around 40% of students chose the cooperative action in our cooperation game, while 56% donated a portion of their donation endowment. We estimate precise null treatment effects for our prosociality outcomes. These findings suggest that the impact of the intervention is primarily evident in reducing antisocial behavior rather than enhancing prosocial acts among treated children. This result is not necessarily contradictory, as reducing antisocial behavior does not inherently lead to an increase in prosocial behavior. The two behaviors may be driven by distinct mechanisms, and changes in one does not automatically trigger changes in the other (Krueger et al., 2001). However, the reverse relationship may hold: increases in prosocial behavior often involve a reduction in antisocial behavior as documented in Alan et al. (2021).

Economic Implications of Antisocial Behavior. Our sabotage game, along with its implementation in the classroom, allows us to explore possible economic and social justice implications of antisocial behavior within a community. In our context, a classroom can function as a community and correct answers represent the output generated by the efforts of its members. It follows then that the sabotage behavior leads to economic waste (destruction of output) for the community: the more prevalent the anti-social behavior the more economic waste the community incurs. To show this quantitatively and in a causal manner, we perform a simulation exercise. Using the empirical distribution of actual decisions, we simulate expected payoffs for each student by randomly matching them with classmates multiple times (with replacement). Using these payoffs, we calculate key economic aggregates to measure classroom wealth and inequality relative to other classrooms. We focus on the following aggregates: per-capita payoffs, minimum and maximum payoffs, and the Gini coefficient as measures of economic well-being and inequality. We obtain these aggregates under two scenarios: one where sabotage is not possible, termed the "Ideal World," and another where

Table 3: Treatment Effects on Antisocial and Prosocial Behaviors

	Antisocial Behaviours		Prosocial Behaviours		
	(1) Probability of Cancelling	(2) Fraction of endowment used	(3) Probability of Cooperating	(4) Probability of Donating	(5) Fraction of endowment donated
Treatment	-0.076***	-0.037**	0.002	-0.000	-0.006
	(0.019)	(0.016)	(0.031)	(0.027)	(0.019)
Control Mean	0.71	0.35	0.40	0.56	0.25
Observations	2217	2217	2218	2218	2218
Wild bootstrapped p-values	0.000	0.046	0.906	0.978	0.784

Notes: The table reports the estimated treatment effects on antisocial behavior, measured using the decisions in the sabotage game, and prosocial behavior, measured using the decisions in cooperation and donation games. The dependent variable in column 1 is a binary indicator that takes value 1 if the child chooses to cancel her opponent's correct answers and zero otherwise; in column 2: is the fraction of sabotage endowment used (out of 5 tokens) for canceling; in column 3: is the binary variable that takes the value 1 if the child chooses the cooperative action in the prisoner's dilemma game; in column 4: is a binary indicator that takes the value 1 if the child chooses to donate at least one of her 4 tokens; in column 5: is the fraction of tokens donated out of 4 tokens. Regressions (OLS) include strata fixed effects (FE), enumerator FE, the value of the outcome collected at baseline (when collected), the share of immigrants in the class, Raven's score, standardized test scores, gender, immigrant status, parental education, age in months, binary variables identifying students with a reported disability or learning disorder, students who were not autonomous during the survey data collection, students with a special teacher support, students who were absent at baseline or new in the school at endline, class size, binary indicators identifying whether the teacher is a math, Italian, or other subject teacher, as well as their gender, age, years of experience, level of education, eye test score, and binary indicators for holding a full-time or fixed-term contract. Standard errors are in parentheses and clustered at the school level (unit of randomization). The last row reports wild cluster bootstrap p-values calculated following Cameron et al. (2008).

sabotage is allowed, referred to as the "Actual World."

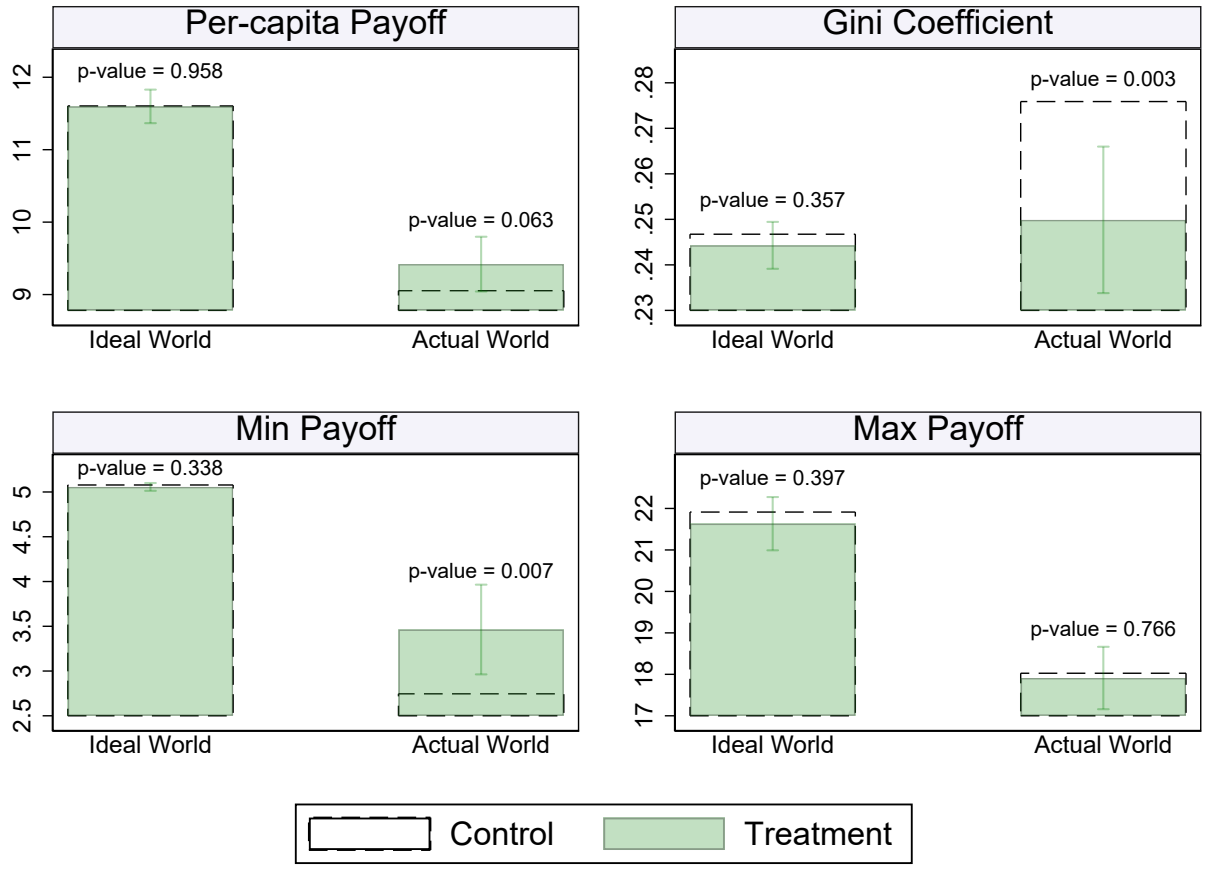
Figure 3 illustrates the average simulated payoffs in both scenarios across treatment groups. As expected, in the "Ideal World," all aggregates are similar across treatment groups due to randomization ensuring balanced task performance. However, when sabotage is allowed, average, minimum, and maximum payoffs are significantly lower due to the economic waste created by output destruction (i.e., canceled correct answers). Specifically, in the control classrooms, per-capita payoffs decrease by 22%, and the Gini coefficient increases by 12% when sabotage is permitted. Nevertheless, treated classrooms achieve significantly higher per-capita payoffs in this scenario and exhibit lower inequality. This improvement in equality in treated classrooms is largely due to higher minimum payoffs compared to untreated classrooms. Treated classrooms have a 26% higher minimum payoff than untreated classrooms while we detect no treatment effect on maximum payoffs. Panel A of Appendix Table A.4 provides classroom-level regression results.[4]

The design of the sabotage game allows participants to undermine their opponents' performance, creating economic waste. Therefore, the lower prosperity and elevated inequality in such a scenario are expected. Admittedly, antisocial behavior within a group can negatively impact individual productivity in multiple ways, not just through direct performance sabotage. Nevertheless, this exercise, while straightforward, provides causal evidence that

[4]Panel B of Appendix Table A.4 reports the same effects for the outcome that has the immigrant reference.

reducing antisocial behavior and fostering a more inclusive environment can enhance the well-being of a community in a broader context. This is particularly important as most evidence on the link between social cohesion and economic well-being is correlational (Easterly et al., 2006).

Figure 3: Treatment effects on classroom-level economic aggregates



Notes: The figure depicts differences in classroom aggregates between treatment and control, with white bars representing control means and green bars representing treatment means. In all four panels, the first set of bars corresponds to the assumption that sabotage was not allowed, referred to as the "Ideal World." The second set of bars represents the scenario where sabotage was allowed, referred to as the "Actual World." To calculate the aggregates, we first calculated expected payoffs for each student by randomly pairing them with a classmate (with replacement). A student's payoff was determined based on their performance, sabotage decision, and that of their pair. This procedure was repeated 500 times. We then calculated aggregate quantities for each classroom, including per-capita payoff, Gini coefficient, maximum payoff, and minimum payoff. The bars in the figure are derived through OLS regression, controlling for strata fixed effects (FE), enumerator FE, the share of immigrants in the class, Raven's score, standardized test scores, gender, parental education, age in months, binary variables identifying students with a reported disability or learning disorder, students who were not autonomous during the survey data collection, students with a special teacher support, students who were absent at baseline or new in the school at endline, class size, binary indicators identifying whether the teacher is a math, Italian, or other subject teacher, as well as their gender, age, years of experience, level of education, eye test score, and binary indicators for holding a full-time or fixed-term contract. Since the regressions are conducted at the class level, individual-level controls are averaged at the class level. P-values are clustered at the school level (unit of randomization).

In sum, the intervention lowered the prevalence of social isolation in the classroom and reduced anti-social behavior without any notable effect on prosocial behavior. These findings

are supported, albeit weakly, by our survey results. Table 4 presents the estimated effects on three indices described in Section 3.2: mental well-being, sense of belonging to school, and perception of teacher behaviour (columns 1 to 3). Column 4 reports the estimate of an average index comprising all three indices. While all coefficients are positive, suggesting improvements ranging from 0.04 to 0.1 standard deviations, estimates lack precision. Notably, the largest estimated effect is observed for the sense of belonging to school, indicating that treated students feel less lonely at school, which is consistent with the results on social inclusion.

Table 4: Treatment Effects on Socio-emotional Well-being

	(1) Mental well-being	(2) Sense of belonging	(3) Perceived teacher behavior	(4) Wellbeing Index
Treatment	0.049	0.103	0.038	0.074
	(0.046)	(0.065)	(0.060)	(0.061)
Control Mean	0.00	0.00	0.00	0.00
Observations	2216	2213	2216	2216
Wild bootstrapped p-values	0.366	0.186	0.610	0.280

Notes: The table reports estimated treatment effects on the indices of mental well-being, sense of belonging, and perceived teacher behavior of students. The average index in column (4) is the average of the nonstandardized indices in columns (1) to (3), standardized relative to the control group. Regressions (OLS) include strata fixed effects (FE), enumerator FE, the value of the outcome collected at baseline, the share of immigrants in the class, Raven's score, standardized test scores, gender, immigrant status, parental education, age in months, binary variables identifying students with a reported disability or learning disorder, students who were not autonomous during the survey data collection, students with a special teacher support, students who were absent at baseline or new in the school at endline, class size, binary indicators identifying whether the teacher is a math, Italian, or other subject teacher, as well as their gender, age, years of experience, level of education, eye test score, and binary indicators for holding a full-time or fixed-term contract. Standard errors are in parentheses and clustered at the school level (unit of randomization). The last row reports wild cluster bootstrap p-values calculated following Cameron et al. (2008).

5 Heterogeneity in Treatment Effects and Potential Mechanisms

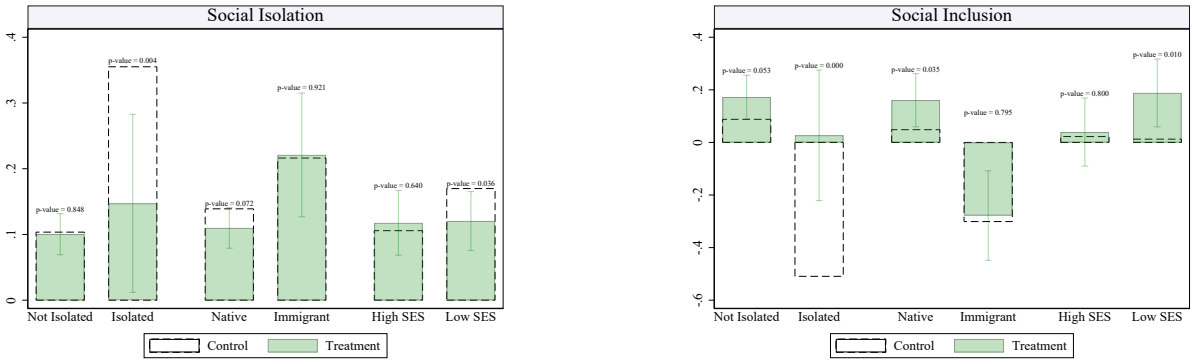
The intervention we evaluated provided teachers with comprehensive insights into the social dynamics of their classrooms, specifically highlighting socially isolated children and the potential risks associated with such isolation. Given that the objective was to integrate socially isolated students into daily activities to mitigate feelings of rejection and loneliness, we estimated heterogeneous treatment effects based on social isolation at baseline, migrant background and socioeconomic status.

Baseline data from the control group show that students with an immigrant background and those from low-SES families are significantly less likely to be nominated as friends by

their peers, indicating lower inclusion in the classroom's social life. Figure 4 presents the estimated treatment effects on social isolation and social inclusion across three heterogeneity categories. The treatment effect is notably stronger for students who were socially isolated at baseline and those from low socioeconomic backgrounds, but not for students with an immigrant background. Unexpectedly, the treatment was more effective at reducing social isolation among native students. Findings on social inclusion generally align with these results.

Figure 4: Heterogeneous Treatment Effects

(a) Social Isolation (b) Social Inclusion

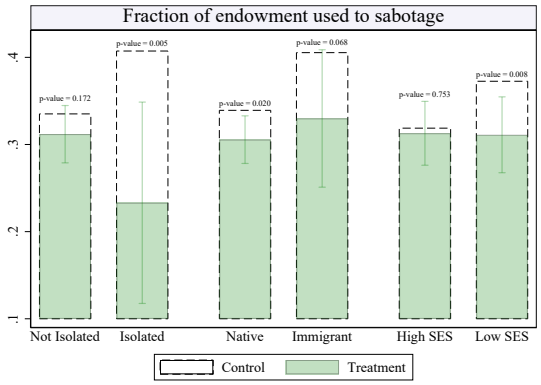


Notes: The figure depicts heterogeneous effects of the treatment on the respective outcome based on social isolation status, native vs migrant, and low vs high SES. High SES is a binary indicator equal to one if at least one parent has a university degree. The dependent variable in Panel (a) is a binary indicator that takes value 1 if a student is not nominated or does not nominate anyone in the classroom and 0 otherwise (Total Degree ties - Binary). The dependent variable in Panel (b) is the normalized number of Total-Degree ties (In-Degree + Out-Degree) standardized relative to the control group. The white bars show the control mean of the outcome for a specific group. The green bars show treatment effect estimates. Regressions (OLS) include strata fixed effects (FE), enumerator FE, the share of immigrants in the class, Raven's score, standardized test scores, gender, immigrant status, and parental education controls (when relevant in the model), age in months, binary variables identifying students with a reported disability or learning disorder, students who were not autonomous during the survey data collection, students with a special teacher support, students who were absent at baseline or new in the school at endline, class size, binary indicators identifying whether the teacher is a math, Italian, or other subject teacher, as well as their gender, age, years of experience, level of education, eye test score, and binary indicators for holding a full-time or fixed-term contract. Standard errors are clustered at the school level (unit of randomization).

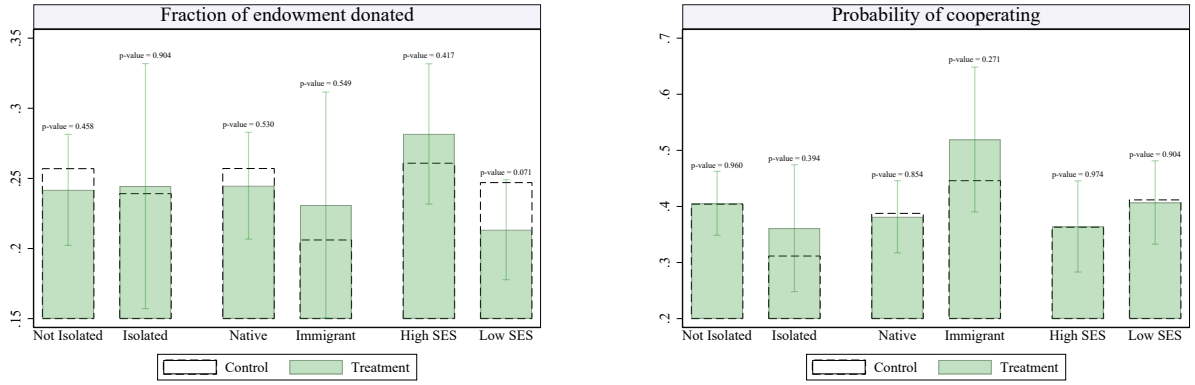
Figure 5 illustrates the heterogeneity in treatment effects for the experimental outcomes: the fraction of endowment used for sabotage, the probability of cooperation, and the fraction of endowment donated. Panel (a) shows that students who were socially isolated at baseline, those with an immigrant background, and those from lower-SES families are more likely to sabotage their opponent in the control group. The treatment effects are larger in absolute value for these groups, suggesting that much of the reduction in antisocial behavior is driven by these disadvantaged students. Consistent with the null effects estimated, we find no notable heterogeneity in treatment effects for prosociality outcomes (Panel b). Similarly, the heterogeneity analysis of socioemotional well-being indicators reported in Table4 revealed no notable heterogeneity (see Figure A.1 in the Appendix).

Figure 5: Heterogeneous Treatment Effects

(a) Antisocial Behaviors



(b) Prosocial Behaviors



Notes: The figure depicts heterogeneous effects of the treatment on the respective outcome based on social isolation status, native vs migrant, and low vs high SES. High SES is a binary indicator equal to one if at least one parent has a university degree. The dependent variable in Panel (a) is fraction of sabotage endowment used (out of 5 tokens) for canceling; the dependent variables in Panel (b) are respectively: the fraction of tokens donated out of 4 tokens (left graph) and a binary variable that takes the value 1 if the child chooses the cooperative action in the prisoner's dilemma game (right graph). The white bars show the control mean of the outcome for a specific group. The green bars show treatment effect estimates. Regressions (OLS) include strata fixed effects (FE), enumerator FE, the share of immigrants in the class, Raven's score, standardized test scores, gender, immigrant status and parental education controls (when relevant in the model), age in months, binary variables identifying students with a reported disability or learning disorder, students who were not autonomous during the survey data collection, students with a special teacher support, students who were absent at baseline or new in the school at endline, class size, binary indicators identifying whether the teacher is a math, Italian, or other subject teacher, as well as their gender, age, years of experience, level of education, eye test score, and binary indicators for holding a full-time or fixed-term contract. Standard errors are clustered at the school level (unit of randomization).

Given these results, a question then arises: what specific actions did teachers take to reduce social isolation and address antisocial behavior in their classrooms after receiving the treatment? One plausible strategy may have been deliberately mixing students for group work, rather than allowing them to self-select into groups. Self-selection often results in ability-based clustering, which is frequently associated with factors such as migrant status and socioeconomic background in primary schools (Juvonen et al., 2019). Our conjecture is that treated teachers made extra effort to include isolated children into the collective classroom activities. Our teacher survey data support this hypothesis. At the endline, we asked teachers about their inclusivity practices through the following questions: "I allow students to choose their own friends for group activities", "I group students by ability level and assign different tasks to each group based on their ability", and "Even if some students don't understand a specific topic, I must continue with the program with the rest of the class." Figure 6 reports the treatment effect on these items, as well as on an Inclusivity Index we constructed by reversing and averaging the responses.

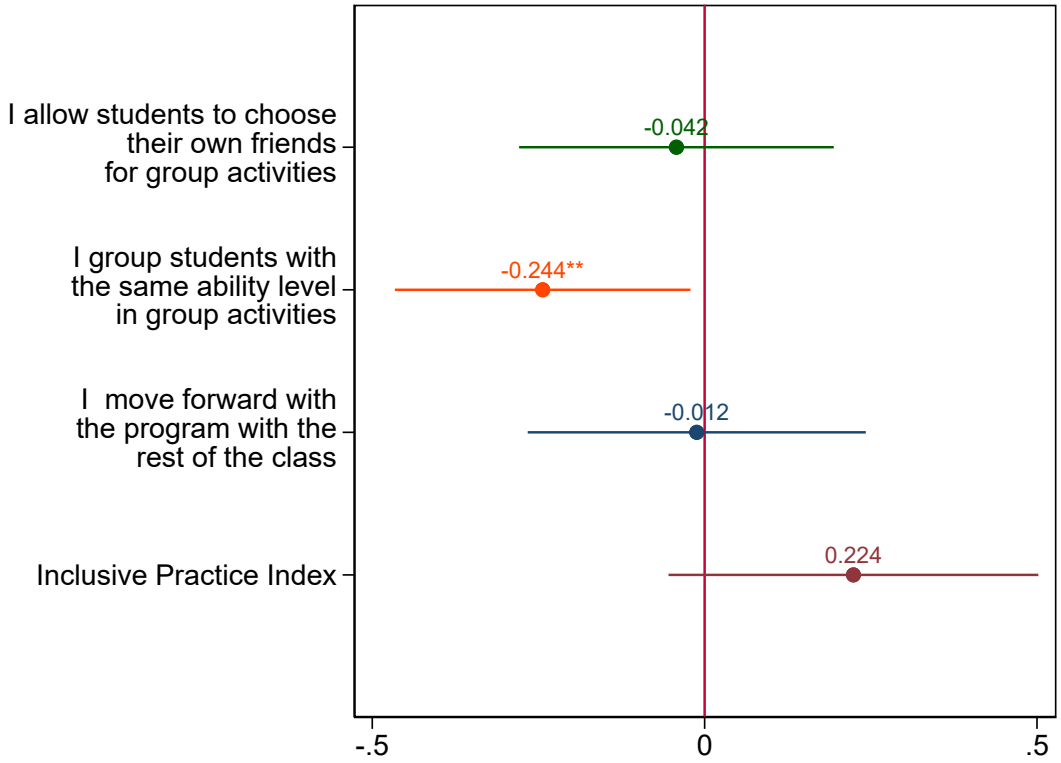
The results suggest that treated teachers were more likely than control teachers to mix students with different ability levels during group work. Given that academic ability is strongly (negatively) correlated with social isolation, migrant status, and socioeconomic status, this practice likely encouraged the inclusion of students from diverse backgrounds in group activities, thus promoting inclusivity.[5]

Social isolation is often accompanied by exposure to antisocial acts and bullying at school (Matthews et al., 2022; Pavri, 2015). Similarly, students who anticipate antisocial behavior from peers may become defensive and, in turn, display antisocial tendencies themselves. The treatment may have reduced social isolation by curbing these antisocial tendencies rather than directly increasing prosocial acts. Consistent with this, we find no evidence supporting an increase in prosocial behavior. However, our main findings suggest a reduction in antisocial behavior. This effect might be attributed to teachers closely monitoring socially isolated students and shielding them from negative interactions. More likely, though, the reduction in antisocial behavior resulted from inclusive practices, such as creating mixed-ability groups and integrating socially isolated students into general classroom activities. These practices likely reduced opportunities for antisocial behavior by fostering contact and

[5]Out of 239 teachers involved in the study, only 163 participated in our endline survey. Our attrition analysis reveals that teachers with temporary teaching contracts and those with lower eye test scores (emotional intelligence) are more likely to be non-responsive to endline surveys. The attrition, however, is balanced across treatment status (p-value=0.557). Panel G of Appendix Table A.2 shows the balance of baseline characteristics of teachers who participated in endline surveys, with no notable imbalance. Figure 6 presents the results obtained using inverse probability weighting to account for this attrition.

inclusion among socially isolated children. Once an isolated child becomes part of a group, they are less likely to engage in or be the target of antisocial behavior.

Figure 6: Treatment effect on inclusive teaching practices



Notes: The figure reports Weighted Least Square (WLS) estimates of treatment on teachers' inclusivity practices. Each outcome is standardized relative to the control mean of zero. The Inclusive Practice Index is the average of all items shown (reversed) and standardized relative to the control group. The weights are computed as the inverse of the predicted probability of being in the endline sample, estimated with a logit model that includes: binary indicators identifying whether the teacher is a math, Italian, or other subject teacher, as well as their gender, age, years of experience, level of education, eye test score, and binary indicators for holding a full-time or fixed-term contract. Regressions (WLS) include strata FE, enumerator FE, the value of the outcome collected at baseline, teacher's gender, experience and eye test score. 95% confidence intervals are calculated via standard errors clustered at the school level (unit of randomization).

In summary, while we cannot conclusively rule out all alternative explanations for our results, our data suggest that specific teacher practices — shaped by the awareness generated through the intervention — played a significant role in reducing social isolation and antisocial behavior in the classroom.

6 Conclusions

This paper evaluates a unique intervention designed to increase teachers' awareness of social dynamics within their classrooms, with a particular focus on socially isolated children. The intervention provided teachers with detailed network maps of their classrooms and highlighted the risks associated with social exclusion in schools. Our findings indicate that the intervention effectively reduces social isolation and curbs antisocial behavior, as measured by a novel incentive-compatible game. These positive results likely stem from teachers adopting more inclusive classroom practices in response to the information provided.

The intervention is highly cost-effective. The staff cost for generating teacher reports, online meetings and WhatsApp monitoring was 18,500 dollars, travel cost was 1900 US dollars, PI time for teacher training was 6670 US dollars, resulting in a total cost of 27,070 US dollars. With 1315 children participating (the total number, not just those surveyed), the cost per child was 21 US dollars. This compares favorably with recent educational interventions aimed at improving school climate (Alan and Kubilay, 2024; Dinarte-Diaz and Egana-delSol, 2024; Sorrenti et al., 2024). However, there are two important caveats to note. First, the intervention consists of two components: providing teachers with detailed friendship network maps of their classroom and offering general information on the risk of social isolation and strategies for its prevention. As a result, we cannot disentangle the individual effects of each component on the observed results. Nonetheless, our findings suggest that even a basic feedback mechanism— giving teachers insights into their classroom's social dynamics and highlighting the importance of addressing social exclusion— can serve as a cost-effective approach to reducing social isolation and antisocial behavior in schools. The second caveat concerns the scalability of the intervention. The intervention was implemented and monitored by researchers. While such involvement is impractical at scale, alternative approaches could include training teachers to independently assess their classroom's social networks using simple templates, allowing them to identify social isolation on their own.

Our study shows that a straightforward intervention—informing teachers about the social structure within their classrooms and possible consequences of social isolation—can go a long way in reducing social exclusion among young children. Given the critical role that positive social environments and healthy peer relationships play in children's development, it is crucial to continue exploring and refining such interventions. By doing so, we can ensure that schools become nurturing environments where all children can thrive socially and academically, ultimately benefiting the wider community.

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In-Paper Appendix

Table A.1: Balance Table

	(1) N	(2) Control Mean	(3) Treatment Mean	(4) Difference (T-C)	(5) SE	(6) p-value
Panel A: Student Demographics						
Female	2536	0.483	0.483	0.001	0.016	0.940
Immigrant	2536	0.143	0.163	0.029	0.026	0.274
Age in months	2482	106.453	106.361	-0.040	0.158	0.801
Any learning difficulty/disability	2536	0.206	0.213	0.007	0.021	0.736
Not autonomous during the survey	2536	0.008	0.010	0.002	0.005	0.766
Absent at baseline	2536	0.138	0.129	-0.022	0.030	0.470
New student in the school	2536	0.014	0.028	0.015*	0.009	0.089
Father has a university degree	2232	0.286	0.200	-0.083	0.064	0.201
Mother has a university degree	2254	0.352	0.284	-0.068	0.063	0.283
Panel B: Social Isolation						
Out-Degree (Binary - Reversed)	2176	0.028	0.023	-0.009	0.007	0.178
In-Degree (Binary - Reversed)	2176	0.128	0.140	0.004	0.017	0.804
Total-Degree (Binary - Reversed)	2176	0.149	0.153	-0.007	0.020	0.739
Panel C: Social Inclusion						
Out-Degree (Continuous)	2482	0.000	-0.006	0.052	0.110	0.641
In-Degree (Continuous)	2482	0.000	-0.004	0.034	0.072	0.641
Total-Degree (Continuous)	2482	-0.000	-0.005	0.048	0.103	0.641
Panel D: Prosocial Games						
Probability of cooperating	2174	0.480	0.494	0.018	0.026	0.489
Fraction of endowment donated	2176	0.223	0.194	-0.034	0.021	0.119
Panel E: Socioemotional Well-being						
Mental Health Index	2173	0.006	-0.019	-0.035	0.049	0.476
Belonging to school Index	2175	0.018	-0.011	0.002	0.041	0.965
Perception of Teacher Index	2175	0.016	0.086	0.050	0.145	0.734
Panel F: Cognitive Measures						
Std. Raven score	2176	-0.000	-0.070	-0.043	0.052	0.410
Std. Test Score Italian (Invalsi)	2198	0.000	-0.038	-0.005	0.123	0.965
Std. Test Score Math (Invalsi)	2172	-0.000	-0.120	-0.115	0.120	0.344
Panel G: Classroom Characteristics:						
Classroom Size	135	19.152	19.594	0.418	0.736	0.572
Immigrant Share	135	0.151	0.164	0.021	0.026	0.416
Panel H: Teacher Characteristics:						
Female Teacher	239	0.982	0.984	0.001	0.015	0.960
Teaches Math	229	0.383	0.311	-0.084	0.061	0.174
Teaches Italian	229	0.505	0.516	0.012	0.065	0.851
Fixed Term	235	0.833	0.827	-0.006	0.067	0.930
Full time	235	0.880	0.906	0.026	0.048	0.585
Age	231	50.065	50.669	0.489	1.410	0.730
Years of experience	233	18.953	19.764	1.278	1.691	0.454
Has university degree	224	0.505	0.420	-0.121	0.075	0.113
Eye test score	228	22.477	23.711	1.268**	0.554	0.027

Notes: The table presents the randomization balance at baseline. Social inclusion outcomes, cognitive test scores and survey measures are standardized to have a zero mean and a unit standard deviation for the control group. The Difference (T-C), standard errors (SE) and p-values of the equality test are obtained by controlling for randomization strata and clustering standard errors at the school level (unit of randomization).

Table A.2: Balance Table - Restricted to being present at endline

	(1) N	(2) Control Mean	(3) Treatment Mean	(4) Difference (T-C)	(5) SE	(6) p-value
Panel A: Student Demographics						
Female	2219	0.488	0.489	0.002	0.018	0.913
Immigrant	2219	0.138	0.154	0.023	0.027	0.406
Age in months	2172	106.512	106.252	-0.202	0.147	0.176
Any learning difficulty/disability	2219	0.199	0.197	-0.001	0.019	0.972
Not autonomous during the survey	2219	0.008	0.010	0.001	0.005	0.898
Absent at baseline	2219	0.124	0.117	-0.023	0.030	0.451
New student in the school	2219	0.016	0.032	0.018*	0.010	0.081
Father has a university degree	1975	0.286	0.210	-0.071	0.066	0.281
Mother has a university degree	1994	0.350	0.293	-0.057	0.066	0.393
Panel B: Social Isolation						
Out-Degree (Binary - Reversed)	1936	0.027	0.022	-0.009	0.008	0.235
In-Degree (Binary - Reversed)	1936	0.129	0.132	-0.005	0.018	0.797
Total-Degree (Binary - Reversed)	1936	0.148	0.144	-0.015	0.021	0.481
Panel C: Social Inclusion						
Out-Degree (Continuous)	2165	0.041	0.020	0.042	0.111	0.711
In-Degree (Continuous)	2165	0.034	0.028	0.035	0.075	0.639
Total-Degree (Continuous)	2165	0.043	0.030	0.045	0.105	0.673
Panel D: Prosocial Games						
Probability of cooperating	1935	0.481	0.499	0.020	0.028	0.476
Fraction of endowment donated	1936	0.224	0.187	-0.042**	0.020	0.039
Panel E: Socioemotional Well-being						
Mental Health Index	1933	0.006	-0.017	-0.030	0.047	0.525
Belonging to school Index	1935	0.033	-0.012	-0.013	0.043	0.770
Perception of Teacher Index	1935	0.004	0.082	0.063	0.141	0.658
Panel F: Cognitive Measures						
Std. Raven score	1936	0.006	-0.052	-0.029	0.055	0.600
Std. Test Score Italian (Invalsi)	1967	0.021	-0.030	-0.013	0.125	0.917
Std. Test Score Math (Invalsi)	1946	0.026	-0.104	-0.123	0.120	0.312
Panel G: Classroom Characteristics:						
Classroom Size	135	19.152	19.594	0.418	0.736	0.572
Immigrant Share	135	0.151	0.164	0.021	0.026	0.416
Panel H: Teacher Characteristics:						
Female Teacher	163	0.987	0.977	-0.017	0.022	0.463
Teaches Math	153	0.397	0.325	-0.097	0.087	0.271
Teaches Italian	153	0.589	0.525	-0.050	0.075	0.511
Fixed Term	162	0.921	0.860	-0.057	0.045	0.207
Full time	162	0.934	0.930	-0.004	0.037	0.913
Age	159	51.447	50.807	-0.221	1.692	0.897
Years of experience	160	21.189	20.453	0.344	1.746	0.845
Has university degree	156	0.493	0.383	-0.134	0.084	0.119
Eye test score	153	23.274	23.875	0.555	0.538	0.309

Notes: The table presents the randomization balance at baseline when the sample is restricted to be at endline. Social inclusion outcomes, cognitive test scores and survey measures are standardized to have a zero mean and a unit standard deviation for the control group. The Difference (T-C), standard errors (SE) and P-values of the equality test are obtained by controlling for randomization strata and clustering standard errors at the school level (unit of randomization).

Table A.3: Treatment Effects on Antisocial Behaviors (Ethnic Reference)

	Antisocial Behaviours Ethnic Reference	
	(1) Probability of Cancelling	(2) Fraction of endowment used
Treatment	-0.090***	-0.050***
	(0.029)	(0.017)
Control Mean	0.64	0.30
Observations	2217	2217
Wild bootstrapped p-values	0.014	0.010

Notes: The table reports the estimated treatment effects on antisocial behavior, measured using the decisions in the sabotage game with ethnic reference. The dependent variable in column 1 is the binary indicator that takes the value 1 if the child chooses to cancel her opponent's correct answers and zero otherwise; in column 2 is the fraction of sabotage endowment used (out of 5 tokens) for canceling. Children were informed that their opponent might have foreign-born parents. Regressions (OLS) include strata fixed effects (FE), enumerator FE, the share of immigrants in the class, Raven's score, standardized test scores, gender, immigrant status, parental education, age in months, binary variables identifying students with a reported disability or learning disorder, students who were not autonomous during the survey data collection, students with a special teacher support, students who were absent at baseline or new in the school at endline, class size, binary indicators identifying whether the teacher is a math, Italian, or other subject teacher, as well as their gender, age, years of experience, level of education, eye test score, and binary indicators for holding a full-time or fixed-term contract. Standard errors are in parentheses and clustered at the school level (unit of randomization). The last row reports wild cluster bootstrap p-values calculated following Cameron et al. (2008).

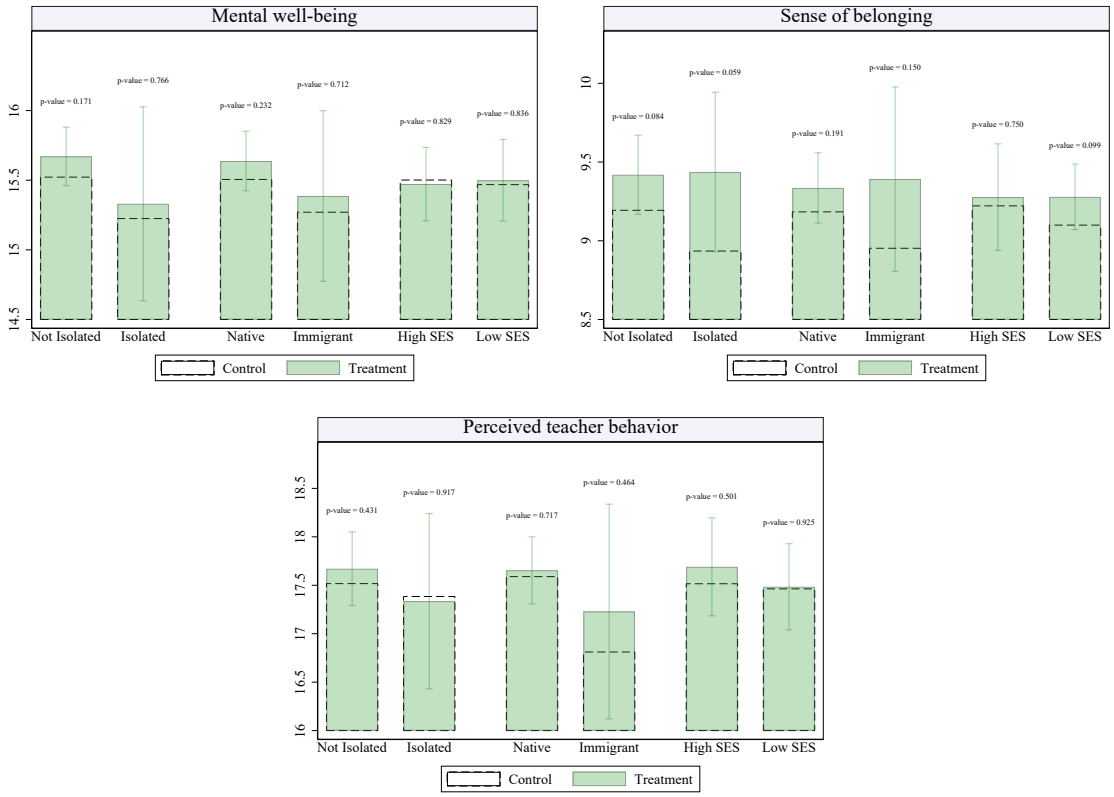
Table A.4: Treatment effects on simulated differences in classroom payoffs

	(1) Payoff	(2) Gini	(3) Min. Payoff	(4) Max. Payoff
Panel A: Ideal World				
Treatment	-0.006	-0.002	-0.022	-0.280
	(0.118)	(0.003)	(0.022)	(0.328)
Control Mean	11.60	0.25	5.08	21.91
Observations	135	135	135	135
Wild bootstrapped p-values	0.948	0.362	0.374	0.452
Panel B: Actual World				
Treatment	0.367*	-0.026***	0.718***	-0.115
	(0.193)	(0.008)	(0.256)	(0.384)
Control Mean	9.05	0.28	2.75	18.03
Observations	135	135	135	135
Wild bootstrapped p-values	0.072	0.002	0.018	0.716
Panel C: Actual World (Ethnic Reference)				
Treatment	0.349*	-0.018**	0.565**	0.128
	(0.186)	(0.007)	(0.234)	(0.362)
Control Mean	9.44	0.27	3.17	18.52
Observations	135	135	135	135
Wild bootstrapped p-values	0.074	0.016	0.026	0.644

Notes: This table reports OLS estimates of the Figure 3. The dependent variables in columns (1) to (4) are respectively the average simulated payoff, Gini coefficient, minimum and maximum simulated payoff of the classroom. Regressions (OLS) include strata fixed effects (FE), enumerator FE, the share of immigrants in the class, Raven's score, standardized test scores, gender, parental education, age in months, binary variables identifying students with a reported disability or learning disorder, students who were not autonomous during the survey data collection, students with a special teacher support, students who were absent at baseline or new in the school at endline, class size, binary indicators identifying whether the teacher is a math, Italian, or other subject teacher, as well as their gender, age, years of experience, level of education, eye test score, and binary indicators for holding a full-time or fixed-term contract. Since the regressions are conducted at the class level, individual-level controls are averaged at the class level. Standard errors are in parentheses and clustered at the school level (unit of randomization). The last row reports wild cluster bootstrap p-values calculated following Cameron et al. (2008).

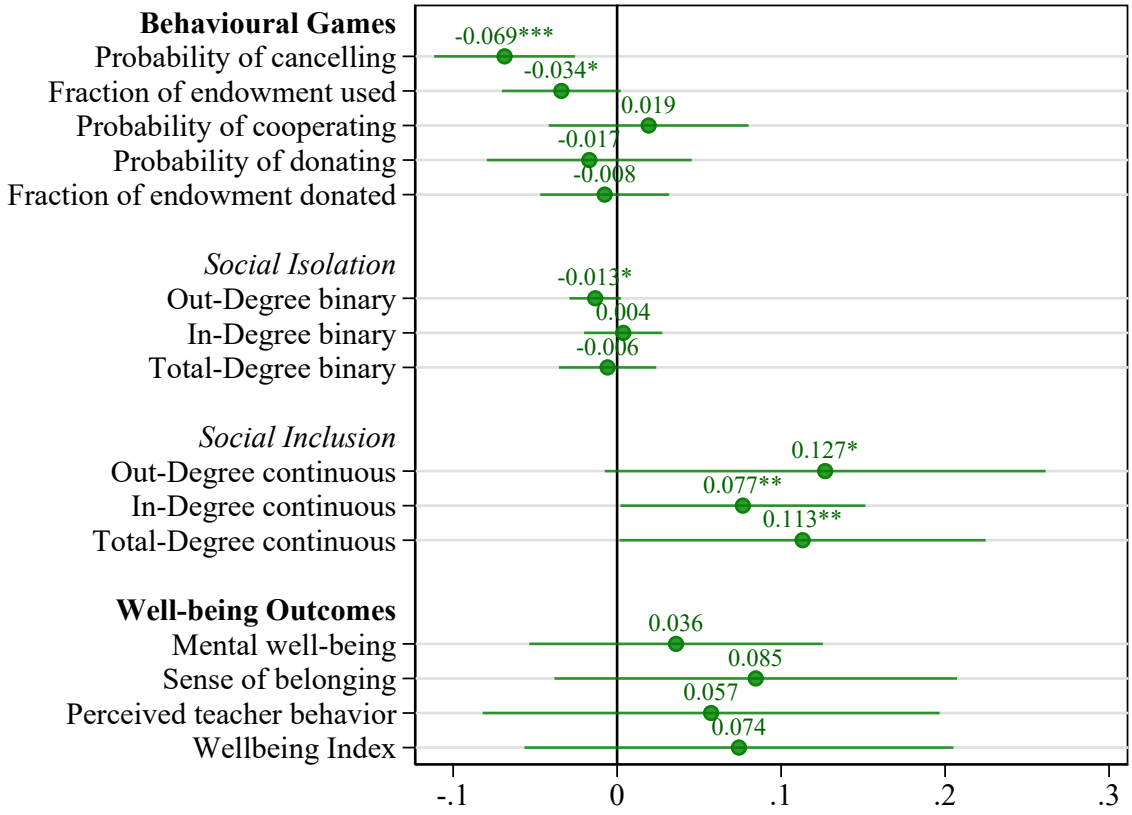
Figure A.1: Heterogeneous Treatment Effects

Well-being Outcomes



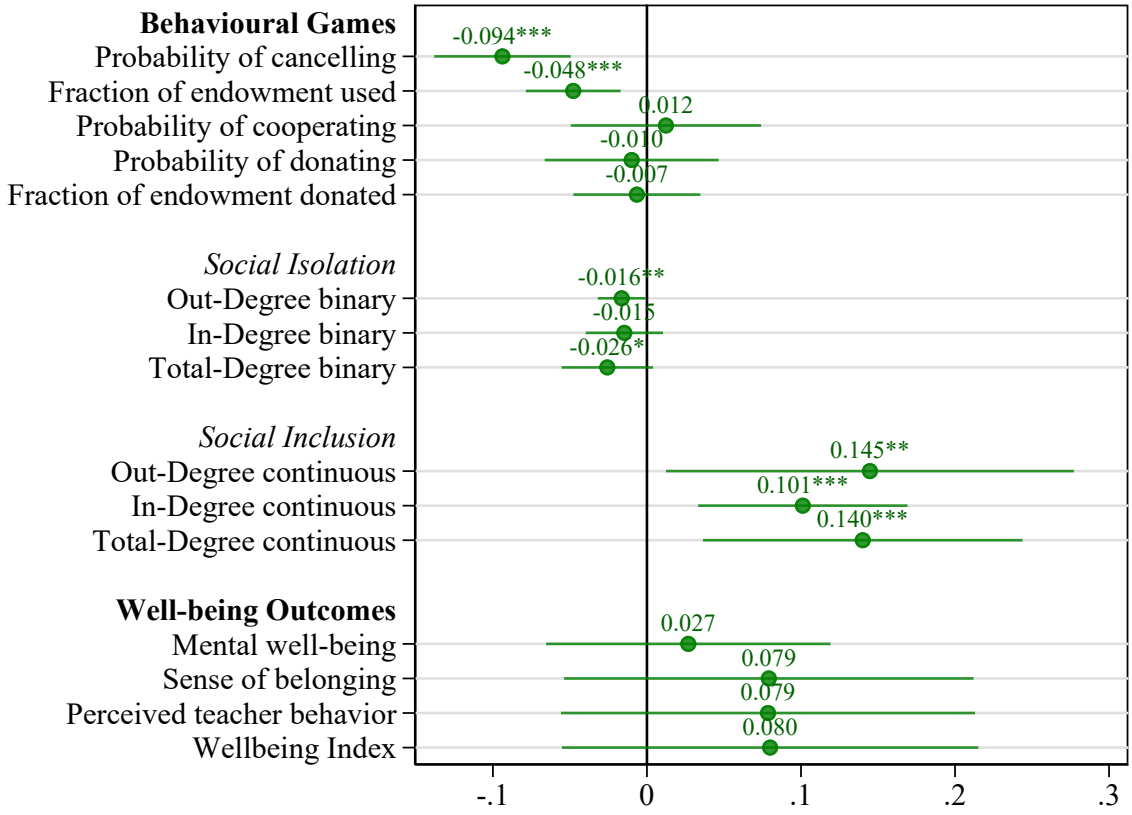
Notes: The figure depicts heterogeneous effects of the treatment on the respective outcome based on social isolation status, native vs migrant, an SES is a binary indicator equal to one if at least one parent has a university degree. The white bars show the control mean of the outcome for a s bars show treatment effect estimates. Regressions (OLS) include strata fixed effects (FE), enumerator FE, the share of immigrants in the class, Ra test scores, gender, immigrant status and parental education controls (when relevant in the model), age in months, binary variables identifying disability or learning disorder, students who were not autonomous during the survey data collection, students with a special teacher support, stud baseline or new in the school at endline, class size, binary indicators identifying whether the teacher is a math, Italian, or other subject teacher age, years of experience, level of education, eye test score, and binary indicators for holding a full-time or fixed-term contract. Standard errors ar level (unit of randomization).

Figure A.2: Estimated treatment effects with basic controls



Notes: The figure reports the estimated treatment effects on the main outcomes. Regressions (OLS) include strata FE, enumerator FE, class size and the share of immigrants in the class. 95% confidence intervals are calculated via standard errors clustered at the school level (unit of randomization).

Figure A.3: Estimated treatment effects with Inverse Probability Weighting



Notes: The figure reports Weighted Least Square (WLS) of the treatment on the main outcomes. The weights are computed as the inverse of the predicted probability of being in the endline sample, estimated with a logit model that includes: strata FE, enumerator FE, the value of the outcome collected at baseline (when collected), the share of immigrants in the class, Raven's score, standardized test scores, gender, immigrant status, parental education, age in months, binary variables identifying students with a reported disability or learning disorder, students with a special teacher support, students who were absent at baseline, class size, binary indicators identifying whether the teacher is a math, Italian, or other subject teacher, as well as their gender, age, years of experience, level of education, eye test score, and binary indicators for holding a full-time or fixed-term contract. The WLS model includes the same controls used in the logit model, a binary indicator for new students present only at endline and a binary indicator for students who were not autonomous during the survey data collection at endline. 95% confidence intervals are calculated via standard errors clustered at the school level (unit of randomization).

Online Appendix-Not for Publication

B A Summary of Treatment Content

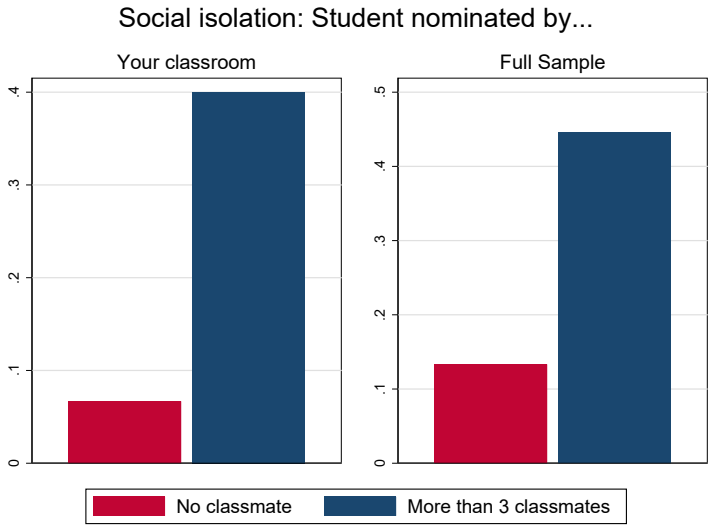
B.1 Summary and extracts of an exemplary classroom report

Introduction. This report is intended for teachers who participated in the DeSS "Development of Social Skills" Project starting from the academic year 2021-2022. The purpose of the report is to present some information on social isolation in the classroom and its effects on the socio-emotional development of students. Each report has the following six sections.

(i) Social Isolation in the classroom. This section reports the degree of isolation in each class and of the entire sample. Figure B.1 is an example. We report below an extract of the explanation provided for the figure.

> ... We report below the **degree of isolation** in your class (left) and the entire sample (right). The first vertical (red) bar shows the percentage of children who are not mentioned by any peers (the most "**isolated**"). The second vertical (blue) bar shows the percentage of children mentioned by more than three classmates (the most "**popular**"). The graph for the *entire sample* shows that there are some children who are mentioned by more than 3 peers, and others who are not mentioned by any peers. For the latter, the average in our sample is around 13%...

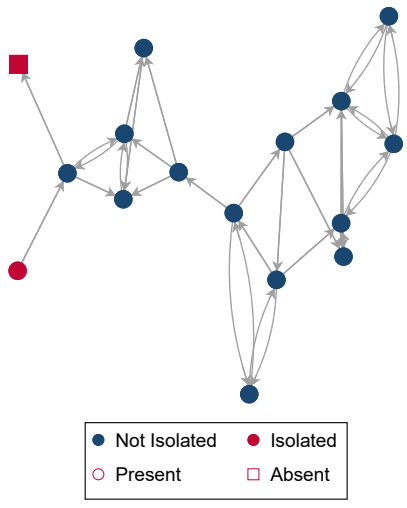
Figure B.1: Degree of social isolation in your class and the entire sample



Notes: The figure is an extract from a teacher report. The figure shows the share of students nominated by none among her classmates (blue bar) and the share of students nominated by more than three classmates (red bar).

(ii) The classroom social network. The report then presents the visual representation of the friendship network of the class. Figure B.2 is an example.

Figure B.2: Network of your class



Notes: The figure is an extract from a teacher report. The figure shows the network composition of a classroom, highlighting isolated (red dots) and not isolated students (blue dots).

We provide careful instructions on how to read each figure. Below an example:

How to read Figure B.2?

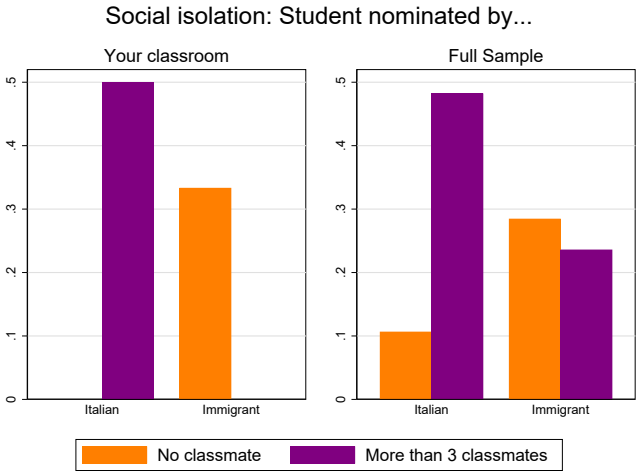
Each circle or square represents a student in your class. Outgoing arrows indicate that the child has named one (or more) children. Incoming arrows indicate that the child has been named by other children (one or more). The colored circles represent students who participated in the activities and were present in class, while squares represent absent students or those who did not participate in the activities. These students could not name any peers (due to absence or lack of parental consent) and therefore cannot have an outgoing arrow. However, these students could still be named by their peers (incoming arrow). The blue color represents children who have been mentioned by at least one classmate ("not isolated"). The red color represents "isolated" children: those who were not mentioned by any classmates.

Note

It is possible that there are no "isolated" children in your class (children not mentioned by anyone). This is positive. However, some children may still be more isolated than others in the class.

(iii) Who are the most socially excluded children? The report then highlights and illustrates that there are some categories of children who tend to be more socially excluded than others (mostly migrant children and from lower socio-economic status). Figures B.3 and B.4 are examples. The report also includes the visual representation of the class network with a distinction between native and foreign children and the degree of isolation and another with a distinction between children with high or low educated parents (see Figure B.5 below). Also for all these figures we provide detailed instructions on how to read them.[6]

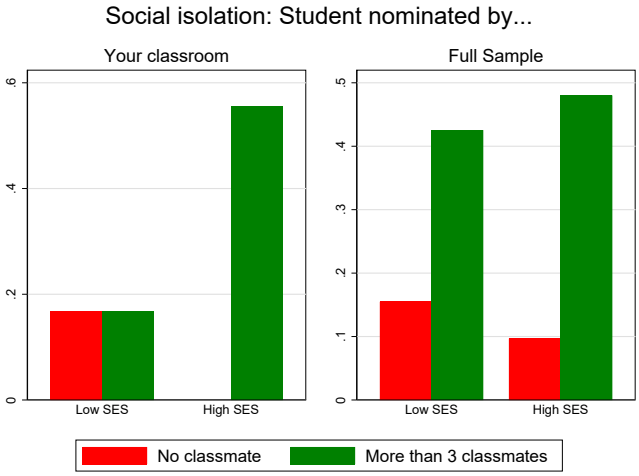
Figure B.3: Degree of social isolation in your class and the entire sample, distinction between natives and foreigners



Notes: The figure is an extract from a teacher report. The figure shows the share of students nominated by none among her classmates (orange bar) and the share of students nominated by more than three classmates (purple).

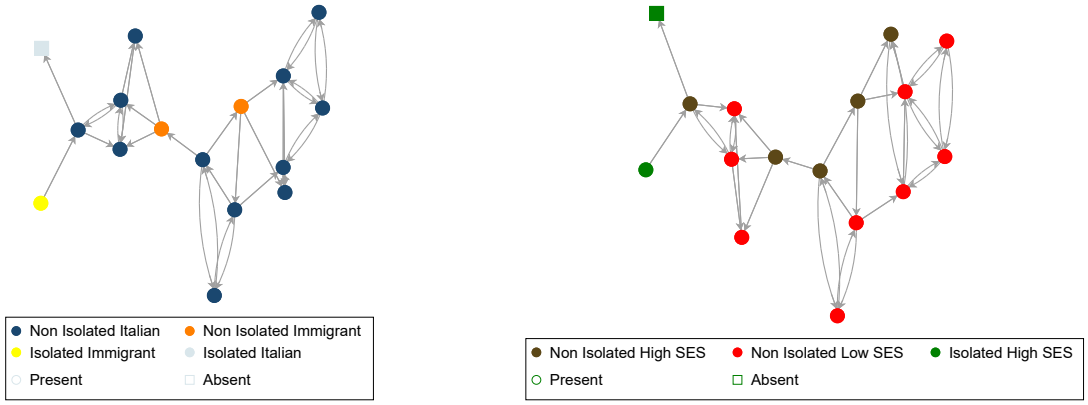
[6]For example for Figure B.3 we explain that if there are no children in one of the categories, the corresponding bar will not be represented in the figure.

Figure B.4: Degree of social isolation in your class and the entire sample, distinction by parents' education level



Notes: The figure is an extract from a teacher report. The figure shows the share of students nominated by none among her classmates (red bar) and the share of students nominated by more than three classmates (green). High SES is a binary indicator equal to one if at least one parent has a university degree.

Figure B.5: Network of your class, distinction between natives and foreigners and between high and low educated parents



Notes: The figure is an extract from a teacher report. The figure shows the network composition of a classroom, highlighting isolated and not isolated students. The figure on the left distinguishes between native and foreign students, while the figure on the right distinguishes between students with high and low educated parents. High SES is a binary indicator equal to one if at least one parent has a university degree.

(iv) Why is it so important? This section highlights the reasons why it is crucial to prevent social exclusion and isolation. We first reference neuroscientific research that shows social exclusion causes pain in individuals who experience it—pain that is comparable to physical pain. This is because the part of the brain called the "Dorsal Anterior Cingulate Cortex" (DACC) is responsible for activating pain. This same region is also activated when

one feels socially excluded.

The report then emphasizes that the perception of social exclusion during childhood has significant negative consequences, both in the short and long term, impacting mental health, perceptions of the school environment, and a sense of belonging to the school. Continuous exposure to social exclusion can make this pain permanent, leading to negative effects in adulthood on mental and physical health, the likelihood of adopting aggressive behaviors, and self-confidence and self-esteem. The negative impact of social exclusion can also be reflected in academic performance, the probability of attending university, and the likelihood of success in the labor market.

We then mention that our analysis of the entire sample shows that more isolated children exhibit poorer socio-emotional states, a more negative perception of the school environment, and a lower sense of belonging to the school. The analysis also reveals that the effects on these indicators are more pronounced for foreign children and those from lower socioeconomic backgrounds. In each report, we include a visual representation of all these relationships for each class.

(v) The role of teachers: children's perception. The report reiterates that each teacher plays a fundamental role in the emotional development and formation of social skills in their students. It emphasizes that data analysis for the entire sample shows that the most socially isolated students feel less supported and observed by their teachers. The document then provides visual representation of the relationship between children's perceptions of their teachers' behavior and their degree of social isolation, both within their class and across the entire sample.

We further emphasize how teachers' actions influence the perceptions that children have of them, highlighting that the more teachers engage in behaviors that specifically address the needs of socially isolated students, the more they can contribute to improving these children's socio-emotional well-being and, more broadly, to the development of socio-emotional skills across the entire class.

(vi) What actions can you put into practice every day? The last section of the report includes practical suggestions on which actions and behaviors to adopt to ensure that every child is included in the relational system and in activities implemented every day in class. Below we provide a short summary of the practical tips included in the report:

- Regularly ask to children how they feel, particularly to the most isolated ones.
- Try to get all the children invited to birthday parties (provided concrete suggestions)

- Play the game "How would I feel in his /her place if...". Give examples of exclusion situations.
- Assign homework to a group, giving a role of responsibility to each child (spokesperson, note taker, ..) and make sure that everyone tries out different roles during various activities.
- Ensure that groups formed during activities consist of students with diverse characteristics, skills and abilities.
- Pay attention to how students are sitting and make sure to make them interact by varying where they are sitting.

B.2 Online meeting with teachers: Summary

Each online meeting followed in general the same structure of the personalized report. We provide below a short summary of the central elements of the meeting. We started with an introduction of the project and then highlighted the great importance of teacher's role for the socio-emotional development of students ("*You are role models for your students and your actions have a significant impact not only at the cognitive level but also on the non-cognitive development of each child.*"). We emphasized how important their role is in the formation and functioning of **social relationships** within their classes ("*the way children interact with each other and spread information and knowledge can have permanent consequences on the cognitive and non-cognitive development of the child*") and how these effects can persist into adolescence and adulthood and manifest in various areas, such as academic performance, the likelihood of continuing education, labor market outcomes, and physical and mental health. We then asked teachers to indicate how many students in their classes might not have been mentioned by any peers. Figure B.6 shows the responses and indicates that 81% of the teachers present at the meeting believed that there were less than 10% isolated students in their class. One in four teachers believed there were no isolated children in their class. We then immediately revealed teachers that their perception of isolation was well below the sample average and provided visual representation of this figure (see Figure B.7).

Figure B.6: Perception of the degree of isolation by teachers present at the online meeting on 11/17/22

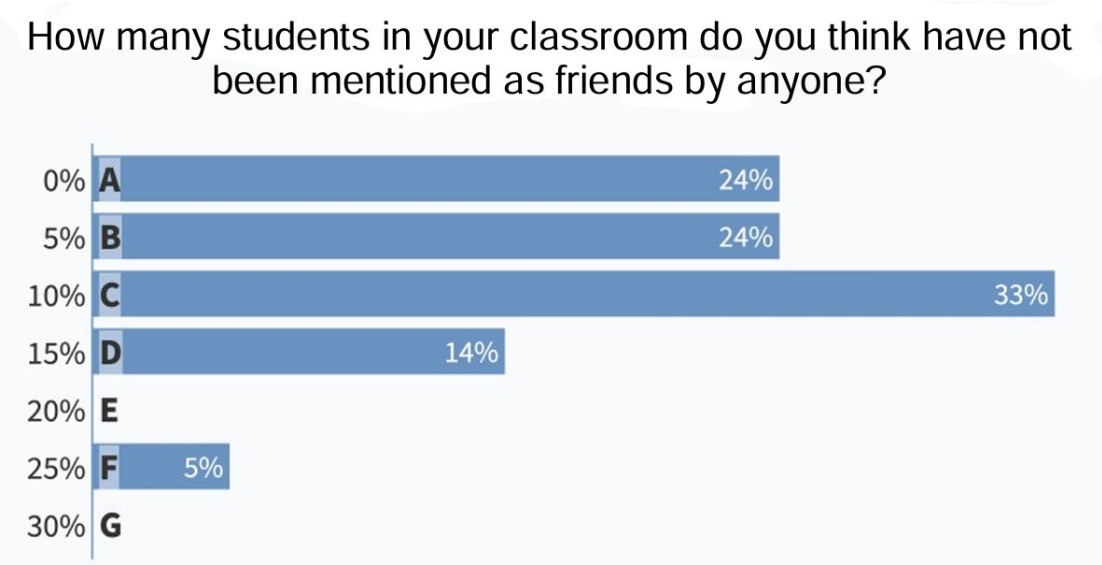
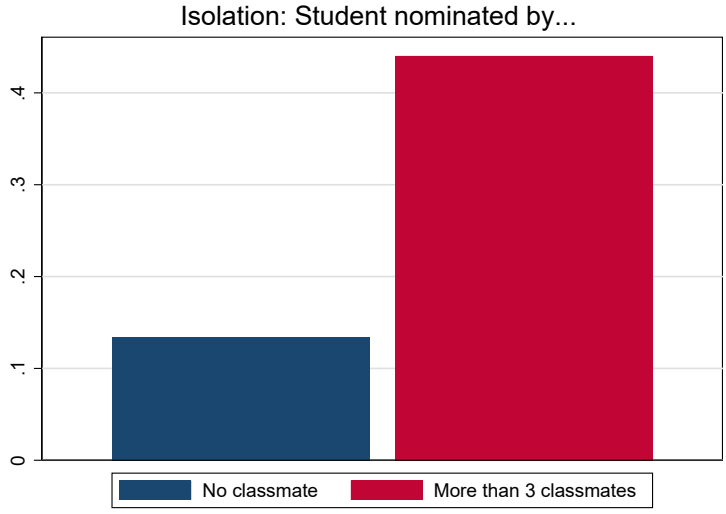


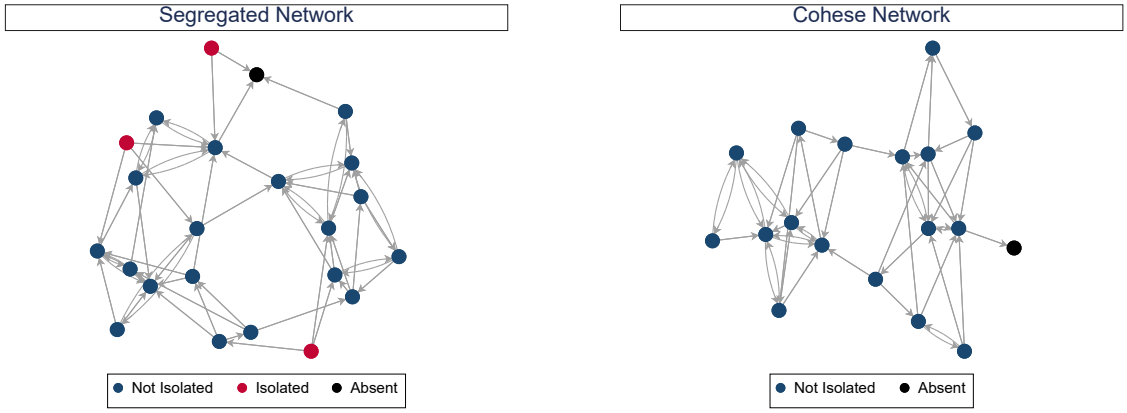
Figure B.7: Social Isolation (whole sample)



Notes: The figure shows the share of students nominated by none among her classmates (blue bar) and the share of students nominated by more than three classmates (red bar). To create this figure it was used the whole sample at baseline.

Classroom networks. We then provided a visual representation of examples of segregated and cohesive networks of selected classes (see figure B.8).

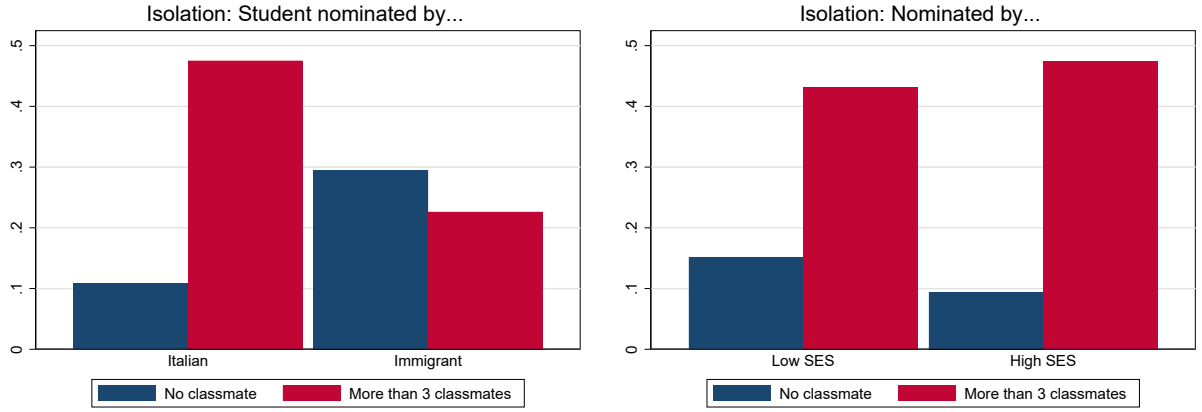
Figure B.8: Network of selected classrooms



Notes: The figure shows the network of students in two specific classrooms. Each node is a student in the classroom. Each edge represents whether the student is nominated as best friend the classmate.

Social isolation by migrant status and socioeconomic background. We showed that on average in our sample social isolation is more prevalent among immigrant students and students with a lower socio-economic background (see Figure B.9). We also provided visual representation of segregated and cohesive networks of selected classes highlighting how in segregated networks the most isolated are immigrants and lower SES students.

Figure B.9: Social isolation of selected classrooms by immigration status and by parents' socioeconomic status



Notes: The figure on the left shows the share of students nominated by none among her classmates (blue bar) and the share of students nominated by more than three classmates (red bar). Moreover, the sample is split in two groups: italian students and immigrant students. To create this figure it was used the whole sample at baseline. The figure on the right shows the share of students nominated by none among her classmates (blue bar) and the share of students nominated by more than three classmates (red bar). Moreover, the sample is split in two groups: low socio-economic status (SES) students and high SES students. The SES is proxied by a dummy equal to one if at least one parent has a university degree. To create this figure it was used the whole sample at baseline.

Social isolation and student well-being. As in the personalized report we highlighted the reasons why preventing social isolation and social exclusion is crucial. We explain the adverse consequences these can have both in the short term and in the longer-term on several later-life outcomes (e.g., health, education, employment). We then showed using our data the correlation between social isolation and our indicators of students well-being (mental well-being, sense of belonging to school and perceived teacher behavior).

Practical tips: we concluded the meeting by providing some practical suggestions of inclusive practices summarizing those included in each personalized report (see above).

C Survey Items

Table C.1: Student Survey Inventories

Inventory	Items	Baseline	Endline
Choose how often you have felt this way during the last week (Never/ Rarely, Sometimes, Often, Always)			
Mental Well-Being	I am happy	✓	✓
	I get upset quickly	✓	✓
	I feel lonely	✓	✓
	I enjoy a lot of things	✓	✓
How often do these things happen in your class? (Never/ Rarely, Sometimes, Often, Always)			
Italian teacher's perceived behaviour	My Italian language teacher notices when I am sad	✓	✓
	My Italian language teacher praises me for good work.	✓	✓
	My Italian language teacher screams or yells at me.	✓	✓
Math teacher's perceived behaviour	My math teacher notices when I am sad	✓	✓
	My math teacher praises me for good work.	✓	✓
	My math teacher screams or yells at me	✓	✓
Thinking of your school: How often do these things happen? (Never/Rarely, Sometimes,Often, Always)			
Sense of belonging at school	I prefer not to come to school if I could	✓	Reversed
	I feel my classmates like me	✓	✓
	I feel lonely at school	✓	✓

Table C.2: Network Elicitation Templates

	None	1	2	3
My best friends in the class				

Notes: The respondent can select at most 3 classmates she considers as best friends

Table C.3: Teacher Survey Inventories

Inventory	Exemplary Items	Baseline	Endline
Teaching experience	Which of the following subjects do you currently teach? (Select all that apply)	✓	✓
	How many years of teaching experience do you have in primary and/or secondary school?	✓	✓
	What is your highest level of education (excluding teacher training)?	✓	✓
	What is your current employment status as a teacher?	✓	✓
	What type of contract do you have?	✓	✓
Socio-demographic characteristics	What is your gender?	✓	✓
	What is your date of birth?	✓	✓
Teacher's emotional intelligence	Eyes Test	✓	✓
5-point likert scale: Strongly disagree/Disagree/Neither agree or disagree/Agree/Strongly agree.			
Teaching styles and practices	I allow students to choose on their own friends for group activities.	✓	✓
	I group students with the same ability level and assign different tasks to each group based on their ability levels.	✓	✓
	Even if some students don't understand a specific topic, I must move on with the program with the rest of the class.	✓	✓