# Social and Academic Peer Effects: Experimental Evidence from Selective High Schools in Peru

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**Abstract**

Despite the importance of social skills for labor market outcomes, there is little evidence on how schools can develop them. This paper studies whether interacting with sociable peers improves social skills. I estimate social and academic peer effects from a large-scale field experiment at selective public boarding schools in Peru. The study uses a novel design, randomizing two types of neighbors in dormitories: (1) less or more sociable (identified by the friendship network) and (2) lower- or higher-achieving (determined by admission scores). The results show that the sociability of peers improves social skills, but only for boys. More sociable neighbors also reduce school dropout rates and increase enrollment at better colleges for less sociable boys. While for boys, academic peer effects are a precise zero, higher-achieving girls decrease the performance of lower-achieving ones. Gender differences in self-confidence and preferences for competition appear to explain these findings. Overall, these results suggest that social skills matter for later-life outcomes, and schools can enhance social skills by targeting the sociability of peers. The impact of said policies largely depends on gender.

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## 1 Introduction

Social skills are a determinant of individuals' well-being and labor market success. For instance, social skills are essential for communication within organizations, team productivity, and management practices (Woolley et al., 2010; Adhvaryu et al., 2018; Hoffman and Tadelis, 2018). Skills such as teamwork, collaboration, and leadership are among the most demanded by firms in the US (Casner-Lotto and Barrington, 2006; Jerald, 2009) and developing countries (Novella et al., 2019). As they facilitate interactions between people, robots cannot easily substitute them in labor tasks (Autor, 2014). Recent empirical evidence shows that the labor market increasingly rewards social skills (Deming, 2017), and that social skills are complementary to cognitive skills (Weinberger, 2014). Despite this recognition, there is little research in economics on how social skills are formed.

Policymakers may be able to use peer effects to influence the formation of social skills. Existing evidence documents that social interactions are a powerful tool to change students' decisions and preferences. Peer pressure affects educational investment decisions (Bursztyn and Jensen, 2015; Bursztyn et al., 2018), and preferences for minority groups change when students have contact with black or low-income peers (Boisjoly et al., 2006; Carrell et al., 2015; Rao, 2019). More broadly, there is an extensive literature on peer effects in education (Epple and Romano, 2011; Sacerdote, 2011). Even though the results on test scores are not conclusive, most studies show peer influences on other outcomes such as crime and career decisions (Sacerdote, 2014). This evidence makes peer characteristics a natural mechanism to study the formation of social skills in schools.

This paper reports estimates of social and academic peer effects from a large-scale field experiment at selective boarding schools in Peru —the COAR Network. COAR is a public school model for the most talented low-income students in the country, and one of the largest programs in the national budget for education. The COAR Network is composed of 25 schools spread across every region of Peru and enrolls approximately 3,000 students every year. I use a novel experimental design to generate exogenous and large variation in peers skills. Specifically, I assign students to two cross-randomized treatments in the allocation to beds in a dormitory: (1) less or more sociable neighbors, and (2) lower- or higher-achieving neighbors.

My experimental design surmounts many of the challenges with traditional approaches to study peer effects. Most studies exploit a random assignment to dormitories and classrooms. Even though this procedure implies exogenous peers, the variation in peer characteristics is weak by construction (Manski, 1993). Besides, multiple attributes of peers (test scores, demographic characteristics, unobservables) are varying at the same time. The use of numerous variables and non-linear functional forms in peer effects models aggravate these concerns. Angrist (2014) relates weak variation to weak-instrument bias and argues that this can explain the failure of optimal policies based on peer effects estimates (Carrell et al., 2013).[1] The fact that different peer attributes all vary at the same time in a random assignment can also be uninformative towards policy recommendations. For example, Ipshording and Zölitz (2019) estimate the value of a peer and find that while this value is substantial, observable characteristics have no predictive power on it.

[1] The exact quote in Angrist (2014) is: "The disappointing Carrell et al. (2013) results seem to me more likely to originate in the spurious nature of econometric estimates of peer effects than in endogenous social stratification."

My design alleviates the concern about weak variation and minimizes the impact of observed and unobserved peer characteristics which are not part of the treatments. The experiment ensures substantial differences exclusively on sociability and academic achievement. Hence, my results are informative for optimal policies along these two dimensions.

The experimental design carries three steps: (1) categorize students into types, (2) assign them to treatments, and (3) allocate them to beds. To classify students as less vs. more sociable, I collected data on the social networks the year before the intervention. I asked students who were their preferred roommates, their friends, and with whom do they study or play. I construct a general network aggregating the four questions and use the eigenvector centrality as a measure of sociability.[2] To classify students as higher- vs. lower-achieving, I use students' scores from the admissions tests, which include math and reading comprehension questions. I perform a stratified randomization of the students to the two treatments and organize them into groups. The schools follow these groups to allocate students to specific beds in the dormitories. This procedure ensures that the type of neighbor coincides with the assigned treatment. The schools indeed followed this protocol as the treatments predict the characteristics of students' neighbors. Moreover, this allocation affects social interactions. Students befriend, study, and play more with peers that, based on the original assignment, should be in nearby beds. This shows that the implementation of the experimental design was successful.

I estimate the impact of each treatment on social and academic outcomes. I consider three different types of social outcomes. First, I use the number of connections and the centrality in the social network after the intervention. Second, a social skills index based on different psychological tests that measure social skills.[3] Third, an index based on the perception of others —the number of peers that perceive the student as a leader, or a popular, friendly, or shy person. To measure academic outcomes, I use grades and standardized tests in math and reading comprehension.

My results show that sociable peers have a positive effect on social outcomes, but only for boys. Those assigned to more sociable neighbors have 0.4 more connections in the social network after the intervention (p-value 0.072). The less sociable boys at baseline mainly drive this positive effect as they end up with 0.8 more connections (p-value 0.006). This result is consistent across other measures of social skills. I find a positive impact on the centrality (p-value 0.009), the social skills index using psychological self-reported tests (p-value 0.000), and peers' perception (p-value 0.088) for all boys. All of these effects are stronger for the less sociable boys with an impact of 0.186 s.d. on centrality (p-value 0.000), 0.207 s.d. on the social skills index (p-value 0.001), and 0.084 s.d. on the peers' perception index (p-value 0.015). These results remain after multiple robustness checks including randomization inference and multiple hypotheses testing. By contrast, I do not find that more sociable neighbors affect social outcomes for girls. I also do not find robust evidence that higher-achieving neighbors affect social outcomes.

Contrary to the results on social skills, I find that higher-achieving peers have no impact on the average academic achievement. The treatment effect of higher-achieving peers on test

[2]Eigenvector centrality is a measure of the influence of a student in the social network. A high value of this measure means that a student is connected to many other individuals who themselves have high scores. In my setting, this indicator correlates with other metrics introduced by psychologists to measure social skills.

[3]These include extraversion and agreeableness of the "Big Five" (McCrae and John, 1992; John and Srivastava, 1999; Almlund et al., 2011), altruism, empathy, leadership, emotional intelligence, intercultural sensitivity, and the "Reading the mind in the eyes test".

scores is a precise zero. The estimates are -0.029 s.d. (p-value 0.156) on math and -0.041 s.d. (p-value 0.146) on reading scores. Heterogeneous effects show that higher-achieving peers harm lower-achieving students and especially lower-achieving girls. For them, I find a negative treatment effect of -0.068 s.d. (p-value 0.032) on math, and of -0.129 s.d. (p-value 0.009) on reading. There is also consistent evidence for math grades, and although not significant, also negative estimates for reading grades. In general, I do not find that more sociable neighbors affect students academic performance, except for a negative effect of -0.069 s.d. (p-value 0.081) on the performance of lower-achieving girls in math.

To account for imperfect compliance between the assignment to treatments and actual neighbors in the dormitories, I exploit the experimental variation in a two-stage least-squares (2SLS) model. I consider a linear-in-means peer effects model that jointly estimates the impact of neighbors' sociability and academic achievement on students' outcomes. This model also provides estimates that are more comparable to other peer effects studies. The results show that an increase by one standard deviation in the sociability of neighbors increases an index of all social outcomes by 0.346 s.d (p-value 0.000) for all boys, 0.456 s.d. (p-value 0.000) for the less sociable boys, and 0.298 s.d. (p-value 0.038) for the more sociable boys. By contrast, the effect on all groups of girls is a precise zero. When I look at academic achievement, I find that an increase by one standard deviation in the admission score of neighbors decreases math and reading scores of lower-achieving girls by 0.117 s.d. (p-value 0.036) and 0.206 s.d. (p-value 0.015), respectively.

Recommendations of optimal policies based on these estimates are gender-specific. For this analysis, I consider a social planner that maximizes a function only dependent on social and academic outcomes. Since boys are not affected by the academic skills of their neighbors, optimal policies focus on the allocation by sociability. To maximize the average level of social outcomes, the social planner should mix boys by their initial level of sociability. By contrast, I also conclude from my estimates that optimal policies for girls should focus on academic achievement. As higher-achieving girls reduce the performance of lower-achieving ones, it would be optimal to separate them. These optimal policies solely determined by the peer effects estimates and ignore potential mechanisms behind these effects.

Next, I explore two potential mechanisms as drivers of my results: psychological factors and social interactions. As psychological factors, I consider differences by gender in both, beliefs in oneself (or self-confidence) and preferences for competition. There is evidence documenting that men generally have higher self-confidence than women (Sarsons and Xu, 2016; Mobius et al., 2014), and that women are more averse to competition than men (Gneezy et al., 2003; Niederle and Vesterlund, 2007; Buser and Yuan, 2019). I also consider whether differences in social interactions drive my results. Carrell et al. (2013) find that the magnitude of peer effects depends on whether students are studying or befriending each other. Hence, I explore whether differences in how boys and girls interact with neighbors of different types explain the main effects.

I find evidence suggesting that gender differences in psychological factors are a valid mechanism. First, more sociable neighbors increase the self-confidence in social abilities of the less sociable boys. They are 13.7 points (p-value 0.026) more likely to recognize themselves as a social person. The opposite result holds for less sociable girls, with a negative impact of 9.1 points (p-value 0.031) on this self-recognition. The effect on a self-reported ranking of popu-

larity shows a similar pattern. While I do not find that self-confidence explains the impact on academic achievement, the results are consistent with women being discouraged by competition (Buser and Yuan, 2019). When paired with higher-achieving neighbors, lower-achieving girls are less likely to report wanting to do better (p-value 0.003) or avoid doing worse (p-value 0.043) than their peers.

I also rule out the possibility that the number of social interactions between students and their neighbors is driving the empirical findings as in Carrell et al. (2013). I explore two questions to reach this conclusion: (1) do less sociable boys interact more with their neighbors when these are more sociable?, and (2) do lower-achieving girls interact less with their neighbors when these are higher-achieving? I find evidence against both hypotheses. All students are likely to befriend, study, and play with their neighbors. These interactions occur in similar magnitude regardless of gender, type, and type of treatment.

Finally, I show that the impacts on social skills translate into dropout rates and higher-education outcomes. The latter include college enrollment and enrollment at a certified college as a measure of quality.[4] First, I show that the social skills index correlates with college outcomes after controlling for academic achievement and school-by-cohort-by-gender fixed effects. One standard deviation in social skills increases college enrollment by 1.6 percentage points (p-value 0.04). This value is similar to the correlation of college with reading scores (1.4 p.p., p-value 0.151), and around one quarter with math scores (6.1 p.p., p-value 0.000). The impact on college quality is similar —1.6 p.p. (p-value 0.001)—, larger than the correlation with reading scores, and 47% of the correlation with math scores. Second, I show that more sociable neighbors influence hard outcomes of the less sociable boys. The impact on the dropout rate is negative (2.3 p.p., p-value 0.007). While there is no impact on college enrollment, more sociable neighbors increase enrollment at a certified college (4.8 p.p., p-value 0.028). Both estimates on the dropout rate and college quality are lower when I control for social skills outcomes that are affected by the intervention. Taken together, this suggests that social skills affect later-life outcomes and that the sociability of peers can improve social skills of boys in schools.

**Related literature:** This paper builds on and contributes to four strands of the literature: (i) the formation of social skills, (ii) social networks, (iv) gender differences in self-confidence and preferences for competition, and (iv) the identification and consequences of peer effects.

My results explore how peer characteristics affect the development of social skills in school, extending the literature on the formation of social skills. While a substantial body of evidence documents positive and increasing returns to social skills in the labor market (Deming, 2017), little is known about how social skills are formed. There are a few exceptions: Rao (2019) shows that rich students are more altruistic and discriminate less when they are exposed to poor peers. Similarly, Falk et al. (2018) find that a mentorship program in Germany increased children's pro-sociality. Adhvaryu et al. (2018) show that an on-the-job soft skills training program in India increased female workers' extraversion and communication.

This paper also builds on the literature on social networks. While some evidence highlights the role of eigenvector centrality for the diffusion of microfinance (Banerjee et al., 2013) and the monitoring of savings decisions (Breza and Chandrasekhar, 2019), this paper confirms

[4]Due to a law issued in 2014, all colleges need to fulfill a minimum requirement of quality to receive a certification of the Government. By 2019, only 73 institutions have been certified. I use this certification as a measure of college quality.

that eigenvector centrality is correlated with social skills as measured by psychological tests. Moreover, my results show that having highly central peers has a positive effect on boys' social skills.

The literature on differences by gender, both in beliefs about personal ability and competition, is also connected to my results. The formation of beliefs about personal skills can differ by gender. Men are less conservative that women when they update their beliefs, as they tend to overestimate more positive signals (Mobius et al., 2014). Gender stereotypes also play a role in forming beliefs of oneself and others (Bordalo et al., 2019), and the collective creation of ideas within a group depends on the interaction of gender and gender stereotypes in an area of knowledge (Coffman, 2014). My results suggest that boys and girls have different ways of updating their beliefs in their personal ability, once they interact with more sociable peers. Additionally, there is a vast literature showing that women are more averse to competition than men (Gneezy et al., 2003; Niederle and Vesterlund, 2007), and more likely to stop competing when they lose (Buser and Yuan, 2019). Here I find that lower-achieving girls seem to be discouraged from competition after interacting with higher-achieving ones. Existing evidence showed that women are more averse to compete with men than other women (Gneezy et al., 2003). My results suggest that this aversion could also come from other women who are perceived as stronger.

My conclusions also add to the broader literature on academic peer effects (Epple and Romano, 2011; Sacerdote, 2011). While the literature is not conclusive about the sign or the magnitude of the impact that peer effects can have on test scores (Sacerdote, 2014), the research designs used by different authors seem to play a major role in explaining the variance of estimates within the literature. Most studies find small positive peer effects when schools randomly allocate students to small groups such as dormitories (Epple and Romano, 2011; Sacerdote, 2001), and sizeable significant estimates in large groups such as classrooms (Duflo et al., 2011), squadrons (Carrell et al., 2009), or large-size dormitories (Garlick, 2018). While my results contradict this evidence, they are consistent with research designs that generate substantial variation in peer characteristics (Abdulkadiroğlu et al., 2014; Duflo et al., 2011). I cannot disentangle whether these differences are context-specific or due to the research design. However, it highlights the methodological concerns that a random allocation has, as pointed out by other researchers (Manski, 1993; Angrist, 2014; Caeyers and Fafchamps, 2016). I also find that, contrary to previous evidence (Carrell et al., 2013), high-skilled peers can harm low-skilled students, even when they are befriending each other. This evidence suggests that further studies are needed to understand the differences between peer effects from friends and others.

The rest of the paper is organized as follows. Section 2 describes the setting of exam schools in Peru. Section 3 presents the experimental design. Section 4 shows the balance of the randomization and the impact of treatments on peer and friends characteristics. Section 5 describes the outcomes and outlines the empirical strategy. Section 6 documents the results on skill formation. Section 7 discusses potential mechanisms for the results. Section 8 presents evidence on hard outcomes. Section 9 concludes.

## 2 Setting: Exam Schools in Peru

The Peruvian Government operates a series of exam schools, *Colegios de Alto Rendimiento* (the COAR Network) to provide a high-quality education for the most talented low-income students

during the last three years of secondary school. The first exam school opened near Lima, the capital of Peru, in 2010. As of 2017, there is now a COAR school in each of the country's 25 regions. There are 100 slots per cohort in each school, except for the school in Lima, which has 300.

The COAR Network meets the standards of elite private high schools in Latin America, where students have access to all the required inputs for a high-quality education. COAR are boarding schools, deliberately located close to the capital city of each region to reduce daily transportation costs for both families and the government. Upon admission, students receive school materials, uniforms, and a personal laptop for school use. All of the schools have a high-quality infrastructure, including a library and excellent scientific laboratories. Students also have the option of obtaining a world-renowned International Baccalaureate (IB) degree. Teachers are hired outside the public school system and receive higher salaries. The government covers all the necessary operating expenses, including laundry service and food.

Applicants are eligible for admission into COAR if they ranked in the top 10 of their public school cohort in the previous academic year. The admissions process consists of two rounds. In the first round, applicants take a written test in reading comprehension and mathematics. The highest-scoring applicants move onto a second round, during which psychologists rate them based on two activities: a one-to-one interview, and the observation of peer interactions during a set of tasks. I refer to these scores as the *interview* and *social fit* scores, respectively. Admissions decisions are determined by a composite score of all three tests, by the region of origin, and by the applicant's school preferences.

Before the experiment, school directors implemented their own individual systems to allocate students to dormitories and classrooms. Most schools attempted to foster multi-cultural diversity by mixing students from different regions within the same dormitory. There was also variation across schools in how they allocated first-year students to classrooms. Classroom assignment for students in the upper cohorts depends on whether students apply for the IB degree and the track they choose for this program.

## 3 Experimental Design

This section presents the experimental design. The objective of the experiment is to estimate the impact of neighbors' sociability and academic achievement on students' outcomes. To do this, I want to ensure systematic variation in peer characteristics across treatments. I do so by classifying students into types according to sociability and academic achievement, and by randomizing students into groups with systematic variation in the type of peer. Thus, there is by design substantial variation in peer characteristics across these groups, surmounting the weak variation problem pointed out by Angrist (2014) in other peer effects studies.

This section is divided as follows. First, I describe the data that was available before the intervention. Second, I illustrate how I used this data to classify students according to sociability and academic achievement. Third, I explain how students were randomized to groups with different types of peers, and describe how I used this assignment to allocate students to dormitories in the schools. Figure 1 illustrates the timeline of the project.

## 3.1 Data

### 3.1.1 Administrative Data

Administrative data on student demographics and baseline scores was collected as part of the admissions process or from existing government databases. For all students enrolled in the COAR Network in 2017, I have data on admissions test scores in three categories: (i) the written test in math and reading comprehension, (ii) the admissions interview, and (iii) the social fit score determined by a team of psychologists.

In addition, I exploit existing government data to describe students' socio-demographic characteristics. The socio-demographic data I use is employed by the Government of Peru to determine households' eligibility for national social programs, and is available for 85% of students. It includes whether a student comes from a household classified as poor or extremely poor, and whether they come from a rural area.

Column 1 of Table 1 reports descriptive statistics for students in the COAR Network. Although these schools target students from the public school system, admitted students have diverse social and economic backgrounds. For example, 35-37% of the students come from poor households, and 20% from extremely poor households. Likewise, 26% of students come from rural households.

For the 2015-16 cohorts, the Ministry of Education also administered psychological tests. Some of these tests incorporate measures of social skills, including emotional intelligence (Law et al., 2004) and the "Reading the Mind in the Eyes" test (Declerck and Bogaert, 2008). Appendix C describes these tests in detail.

### 3.1.2 Surveys

With the Ministry of Education, we administered an online survey to measure social interactions and non-cognitive skills for students in the 2015 and 2016 cohorts. The survey was conducted in class and on a computer, with a compliance rate above 95% for each school. A team of psychologists in each school was in charge of monitoring the survey.

The survey asked students to list the names of their peers in four distinct categories of social interactions: (i) roommate preferences (students were told that their answers to this question could affect their dormitory assignment), (ii) friends , (iii) study partners, and (iv) people with whom they interact in social activities such as playing sports or games. Appendix Table A.1 shows three statistics for each category of the network: total degree, mutual degree, and eigenvector centrality. The average mutual degree is half of (or lower than) the average total degree. For example, when we consider a broad social network that aggregates all four questions about social interactions, students report having 7.02 connections on average, of which only 3.24 are mutual.

The survey also included questions on students' perception by their peers. Students were asked to rank up to five peers in the categories of leadership, friendliness, popularity, and shyness. Table A.1 shows descriptive statistics for these variables. On average, a student was named by 3.48 of her peers as a leader, by 3.59 as the most friendly, by 3.21 as the most popular, and by 2.59 as the shyest.

### 3.2 Classifying Students According to Academic and Social Skills

I use data from the admissions process and baseline social networks survey to identify more sociable and higher-achieving students.

I use the test score in the first round of the admissions process—that evaluates students in math and reading comprehension—to characterize students as lower- or higher- achieving at baseline. This test was taken before students interacted at all. For each school-by-grade-by-gender cell, students above the cell-specific median are classified as higher achieving, and those below the median as lower achieving.

To identify more and less sociable students, I rely on the networks survey at baseline described in the previous section. I use the eigenvector centrality of an aggregate undirected social network that groups the four categories of social interactions described above. Banerjee et al. (2013) and Banerjee et al. (2014) perform a similar aggregation. Other studies have shown that in other contexts, individuals with high centrality are better at diffusing information (Banerjee et al., 2014; Beaman and Dillon, 2018), and monitoring savings decisions (Breza and Chandrasekhar, 2019). I use the same strategy as with the classification by academic achievement. Students with an eigenvector centrality above the cell-specific median are classified as more sociable, and those below the cell-specific median as less sociable. Appendix Figure A.1 shows that in the context of this study, centrality, and admissions test scores are positively correlated.

Table A.1 (columns 2 to 5) presents descriptive statistics of the baseline social networks by student type. More sociable students have a better position in the schools' social networks, with a larger average degree, mutual degree, and eigenvector centrality for the four social networks reported (roommate preferences, friends, study mates, and social partnerships). For example, in the general network more sociable students have, on average, 4 more connections and 1.4 more mutual connections than less sociable students. More sociable students are also perceived as friendly by 4.6 peers on average, while only 2.5 peers perceive less sociable students as friendly.

More interestingly, I also find a large statistically significant correlation of eigenvector centrality and my set of indicators of social skills. Appendix Table A.2 reports standardized coefficients of an OLS regression of social skills measures[5] on the three admissions test scores, and on the eigenvector centrality of the baseline social network controlling for school×grade×gender fixed effects. For most of my social skills indicators, eigenvector centrality has a stronger correlation than admissions test scores. These results confirm that individuals who are assessed as very central in the schools' social networks at baseline also have highly developed social skills.

Since first-year students did not complete the baseline survey in 2016, eigenvector centrality at baseline is not available for this cohort. However, in an attempt to identify *sociable* students in this cohort, I use the *social-fit* test in the admission. In theory, this score comprises measures of empathy, leadership, and teamwork. However, by contrast with the eigenvector centrality, the correlation between the *social-fit* score and more traditional social skills measures is weak. For this reason, I focus on the higher-achieving peers treatment for the first-years. Appendix Tables A.5 and A.6 show that my main results are robust to the inclusion of this treatment.

[5]Some of these variables were collected before or after the intervention. They are described in detail in section 5.1 and Appendix C.

## 3.3 Randomization

To estimate the impact of peers' sociability and academic achievement on students' outcomes, I randomized students to two treatments: (1) more sociable peers, and (2) higher-achieving peers. In the previous section, I explained how students were classified into more sociable and higher-achieving students. Here I explain the details of the randomization.

### 3.3.1 Peer Group Types

By randomizing the type of peer that students have, instead of the simple randomization to groups, I assure that students in my study are exposed to peers with different levels of skills. This is a novel approach and is central to my study. It differs from the more traditional approach that exploits random assignments to groups; where, by virtue of the randomization, peer characteristics are the same in expectation —although there will be small variation across groups in the realized sample.

The experimental design accounts for the fact that a student, not only receives a treatment, but is also a treatment for her peers. Students were allocated to *peer group types* in which they were matched with peers of their respective treatments. In each *peer group type*, half of the peers are of the same type as the student and the other half of the peers are of the type of her assigned treatment.

For exposition, consider the simple case of two types of students: high and low. The researcher is interested in identifying the Average Treatment Effect ($ATE$) of having high-type peers. With two types of students there are three *peer group types*: two homogenous groups, composed of individuals of a single type, and a heterogeneous group composed of individuals of both types. The following matrix shows the composition of *peer group types*:

| | High | Low |
|---|---|---|
| High | Group A | Group B |
| Low | Group B | Group C |

In this case, there are three potential *peer group types*:

a) Group A: a group composed of the high type only.

b) Group B: a mixed group, in which half are high-type students and the other half are low-type students.

c) Group C: a group composed of the low type only.

Notice that, conditional on a student's type, she can be assigned to a homogeneous group (Groups A and C), with individuals of her own type, or to a mixed group (Group B), with individuals of both types.

To illustrate how this generates systematic variation across treatments, compare a high-type student in Group A versus a high-type student in Group B. In Group A, all peers are high types, while in Group B half of the peers are high types and the other half are low types. Hence, the difference in the proportion of high-type peers in Group A versus B is equal to 0.5. The Conditional Average Treatment Effect (CATE) of having high-type peers conditional on being

a high-type student ($\tau_i = H$)can be identified by the difference between high-type students in group A and high-type students in Group B.

$$CATE_H = \mathbf{E}\left[Y_i|\tau_i = H, A\right] - \mathbf{E}\left[Y_i|\tau_i = H, B\right] \tag{1}$$

Similarly, consider a low-type student in Group B versus a low-type student in Group C. In Group B, half the peers are high types and the other half are low types, while in Group C all peers are low-type students. Hence, the difference in the proportion of high-type peers in Group B versus C is equal to 0.5. The Conditional Average Treatment Effect (CATE) of having high-type peers conditional on being a low-type student ($\tau_i = L$) can be identified by the difference between low-type students in group B and low-type students in Group C.

$$CATE_L = \mathbf{E}\left[Y_i|\tau_i = L, B\right] - \mathbf{E}\left[Y_i|\tau_i = L, C\right] \tag{2}$$

Considering the above, the average treatment effect of high-type peers is a weighted average of the CATE in equations 1 and 2, where weights capture the proportion of high type and low type students in the data, respectively. Since I am using the cell-specific median to classify students, the weights are equal.

$$ATE = 0.5 * CATE_H + 0.5 * CATE_L \tag{3}$$

Notice that the statistical power to estimate this average effect is maximized when all peer group types —Groups A, B and C— are of the same size. The number of students who are treated (high-type students in Group A and low-type students in Group B) and the number of students who are not treated (high-type students in Group B and low-type students in Group C) would be the same.

The fact that all three groups are the same size implies that students are twice as likely to be assigned to peers of their same type. Hence, high-type students are twice as likely to receive the treatment (high-type peers) than low-type students. Given that the propensity score of receiving the treatment will vary by student type, we need to account for this in the empirical analysis.

The randomization in my field experiment is analogous to this example, with just one difference. In my randomization I use two treatments instead of one, so rather than two types of students, I have four types: (i) more sociable and higher achieving, (ii) more sociable and lower achieving, (iii) less sociable and higher achieving, and (iv) less sociable and lower achieving. This implies that instead of the three *peer group types* A, B and C from my previous example, there are ten potential *peer group types* in my experimental strategy.[6]

Figure 2 shows the ten possible combinations of types of peers and student types. Each row corresponds to the student type, each column to the type of peer to whom she was assigned, and each cell to the combination of a student type-type of peer or *peer group type*.[7] Each group takes a different cell color in the symmetrical matrix of Figure 2.

I performed the randomization stratifying at the school-by-grade-by-gender level and the student's type. The first stratification (school-by-grade-by-gender) is performed because the

[6] With 4 types of students there would be 16 possible combinations, but 6 of them are redundant.

[7] Group 1, for example, is composed of only more sociable and higher-achieving students. Group 3 is composed of less sociable and higher-achieving with more sociable and lower-achieving students.

allocation to dormitories is specific to these strata. The second stratification (student type) is necessary because students were assigned to *peer group types* based on their type as described in the classification above.

### 3.3.2 Assigning Students to Dormitories

This subsection describes how I implement my experimental strategy. After randomizing students into *peer group types*, as described below, I used these groups to allocate students to the dormitories in the COAR Network.

There is vast heterogeneity in the structure of dormitories across the COAR Network. For example, while the school in Lima has dormitories of three to five students, its counterpart in Cusco has a total of four dormitories, with approximately 80 students per dormitory.[8] To reconcile my *peer group types* with the widely varying number of dorm sizes across schools, I sorted the names of the students on a list based on the 10 *peer group types* mentioned in the previous subsection. This list was later used to allocate students to specific beds in the dormitories. The *peer group types* were randomly ordered on the list[9], and for mixed groups composed of more than one student type, the names of students of different types were alternated. Appendix B describes in detail how the lists determined the allocation to dormitories and classrooms.

The order on the list is directly linked to the physical distance between two students in a dormitory. Students who are adjacent on the list are more likely to be near each other in the dormitories. In small dorms, the assigned peers will likely share the same room. In bigger dorms, students and assigned peers will be either placed in the same bunk bed or in beds next to each other. I used information from the school directors about the types of dorms available when creating my lists. Most of the schools (23 out of 25) in the COAR network used my lists to allocate students to dormitories. There were coordination problems in logistics with the other two schools. In some cases, the school directors sent the allocation they used, and I checked whether it was done based on the lists.

The design protocol was generally followed by school administrators, but in some cases there was not perfect compliance between the order of students on the list and the actual assignment to dormitories. For example, in some schools students were assigned to other beds for health reasons. Likewise, since there is a natural mismatch between the size of dormitories and the size of the peer group types from my randomization, some students did not have their assigned peers as neighbors in the dormitories. I account for this below by considering three relevant groups:

1. Assigned peers: Students assigned to the same *peer group types*.

2. Neighbors: For small dormitories (less than 5 students), I define neighbors as roommates. For larger dormitories (more than 5 students), neighbors are students assigned either to the same or the adjacent bunk bed.

3. Friends: Peers with whom the student reports a social connection after the intervention.

I now show that the distance on the list predicts neighbors and friends. First, schools sent me the exact location in beds of students in the schools, which allows me to test whether they

[8] Appendix Figure 3 shows a picture of the dormitories in the schools in Lima, Piura, and Cusco.
[9] The order was specific to each school×grade×gender.

followed the experimental design empirically. Second, I administered two networks surveys after the intervention (as shown in the timeline in Figure 1). The first survey took place four months after the intervention in August 2017. In this survey, students identified their friends, study partners, and people with whom they engaged in social activities such as playing games or dancing. The second survey took place on December 2017, using the same set of questions. I constructed a general network that aggregates the answers from both surveys. I estimate the following equation to test how the distance on the list affects the likelihood of being neighbors and social interactions:

$$y_{ij} = \gamma_0 + \sum_{k=1}^{9} \gamma_k \mathbf{1}_{d=k_{ij}} + \nu_{ij}, \tag{4}$$

where $y_{ij}$ is a dummy variable equal to one when students $i$ and $j$ are neighbors or friends, and $\mathbf{1}_{d=k_{ij}}$ are dummies for a distance $k$ between students $i$ and $j$ on the list. The equation includes nine dummy variables, each of which represents a distance of 1–9 on the list.

Panel A of Figure 4 shows that the distance between students on the list predicts neighbors in dormitories. The plots show the estimates of $\gamma_k$ with the respective 95% confidence interval. A distance of one on the list increases the likelihood of being neighbors by 72 percentage points (p/value 0.000). A distance of two and three are also large and statistically significant, with an increase by 62 p.p. (p-value 0.000) and 48 p.p. (p-value 0.000), respectively. Overall, Panel A of Figure 4 shows a monotonous decreasing effect of the distance on the list and the likelihood of being neighbors. From a distance of four onward, all the estimates are weaker, and a very precise zero at a distance of six.

Furthermore, the distance on the list has a substantial effect on social interactions. Panel B of Figure 4 shows the likelihood that two students form a social connection as a function of the position on the list. Being at a distance of one on the list increases the likelihood of becoming friends, engaging in social activities together, or studying together by approximately 18 percentage points. I also find a decreasing pattern with distance, showing that the physical location of beds in the dormitories predicts social interactions. Overall, this evidence suggests that the implementation of the experimental design was successful.

## 4 Balance and First Stage

This section shows that the randomization is balanced in characteristics at baseline and that the experiment ensures substantial variation of peer characteristics across treatments. This variation translates into neighbors with different academic skills and sociability at baseline. Furthermore, I also show that the intervention led to the formation of new friendships, influencing the social networks in the schools.

### 4.1 Balance of Baseline Characteristics

I use the following equation to estimate the correlation of the higher-achieving peers' treatment and the more sociable peers' treatment on students' outcomes and baseline characteristics:

$$y_{i\tau} = \alpha + \lambda_s s_{i\tau} + \lambda_c c_{i\tau} + \gamma_\tau + \nu_{i\tau} \tag{5}$$

Equation 5 explores how the treatment of more sociable peers, $s_{i\tau}$, and the treatment of higher-achieving peers, $c_{i\tau}$, correlate with the characteristic of individual $i$ of type $\tau$, $y_{i\tau}$. We include student type fixed effects, denoted by $\gamma_\tau$ since the propensity score of receiving the treatment varies by the student type. The parameters of interest are $\lambda_s$ and $\lambda_c$, which represent the correlation of more sociable and higher-achieving peers, respectively.

In addition to the type fixed effect, all of my estimations control for the stratification variables of my randomization: the strata corresponds to cells by school-by-grade-by-gender-by-student type. Moreover, I control for the dependent variable at baseline to improve the efficiency of my estimates. All of my results are robust to an alternative specification in which baseline covariates are chosen based on the "post-double-selection" Lasso method developed by Belloni et al. (2014a,b). The standard errors are clustered at the student type$\times$*group of peer* level, since all the students within this unit share the same treatment peers.

For the 2017 cohort, I used a similar procedure to the one described in section 3.3.2 to assign students to classrooms. To exploit the same type of variation as with dorm assignments, I include a strata-by-classroom fixed effect for students in their first year when I estimate equation 5. The magnitude of peer effects from roommates could be different to the magnitude of peer effects from classmates. For example, evidence in the literature suggests that teachers change their behavior based on the composition of the classroom (Duflo et al., 2011). Hence, I make sure that the variation in peer characteristics is only in the sociability and academic achievement of neighbors in the dormitories.

I estimate equation 5 on social skills and academic outcomes at baseline for all students, and for all subgroups of sociability, academic achievement, and gender. Table 2 reports these estimates. In general, I find that the treatments are not correlated with social skills and academic outcomes at baseline. Furthermore, Tables A.3 and A.4 present balance tests on all other variables available at baseline. Overall, and as expected from an RCT, I do not reject a zero correlation of the treatments with baseline characteristics. The table also reports the F-statistic of multivariate regressions, which show that for both treatments and across all subgroups of students, treatments are not correlated with baseline characteristics.

### 4.2 First Stage

Next, I explore the impact of the randomization on the number of assigned peers of each type and their average characteristics. First, I estimate equation 5 on the number of more sociable and higher-achieving assigned peers. I also estimate these impacts on the average peer characteristics; this corresponds to the first stage and is depicted in equations 6a and 6b. I also estimate the same set of equations for *neighbors* and *friends* as they were described above.

$$\overline{s}_{p_{i\tau}} = \theta_s + \delta_s s_{i\tau} + \phi_s c_{i\tau} + \gamma_\tau + \xi_{i\tau}, \tag{6a}$$

$$\overline{c}_{p_{i\tau}} = \theta_c + \delta_c s_{i\tau} + \phi_c c_{i\tau} + \gamma_\tau + \nu_{i\tau}, \tag{6b}$$

where $\delta_s$ and $\delta_c$ are the effects of the more sociable peers treatment on the average sociability and academic achievement of peers, respectively. Likewise, $\phi_s$ and $\phi_c$ represent the effects of the higher-achieving peers treatment on the same variables.

As expected from the randomization, the assignment to treatments leads to differences in the type of assigned peers. Table 3 reports the impact of the treatments on the type of peers

that students have and on the average characteristics of these peers. Columns 1 and 2 of Table 3 show how each treatment changed the number of assigned more sociable and higher-achieving peers. In general, being assigned to more sociable peers increases the number of more sociable peers in a student's group by three, and equally as much with higher-achieving peers. That is, students have three additional peers associated with the type of treatment.

The design ensures substantial variation in the average characteristics of assigned peers. Columns 3 and 4 of Table 3 show the impact of the treatments on the average characteristics of the assigned peers. The more sociable peers treatment increases the average sociability of the assigned peers by 0.88 standard deviations. Likewise, the higher-achieving peers treatment increases the average academic achievement of the assigned peers by 0.96 standard deviations. The results also show that, because sociability and academic achievement are positively correlated at baseline, having higher-achieving peers increases a student's peers average sociability, and that having more sociable peers increases a student's peers average academic achievement.

In some cases there is no perfect compliance between the randomly assigned peers and actual neighbors. Hence, I estimate the same set of equations on actual neighbors rather than the peers in the peer group types. For small dormitories (less than 5 students), I defined neighbors as roommates. For larger dormitories (more than 5 students), neighbors are students either in the same or in the adjacent bunk bed.

The data shows that the treatments predict neighbors' characteristics confirming that the schools followed the implementation procedures described in the previous section. The impact on the treatments on Columns 5 to 8 of Table 3 show the effect of each treatment on students' actual neighbors. Columns 5 and 6 show the estimation of equation 5 on more sociable and higher-achieving neighbors. Overall, each treatment, more sociable and higher-achieving peers, increases the number of neighbors of their respective type by 1.6. Columns 7 and 8 show the effect on average neighbors' characteristics. Being assigned to more sociable peers increases the average sociability of neighbors by 0.554 standard deviations. Likewise, the higher-achieving peers treatment increases the average academic achievement of neighbors by 0.588 standard deviations. As expected, due to the non-compliance reasons mentioned above, these effects are not as large as those in columns 1 to 4 of Table 3 on assigned peers, but still very strong and highly significant.

As the intervention had an impact on the social network in the schools, I also estimate equation 5 on the number of friends of each type and average friends' characteristics. Columns 9-12 of Table 3 present the results. More sociable neighbors increase by 0.472 the number of more sociable friends, and higher-achieving neighbors by 0.446 the number of higher-achieving friends. These effects translate into an increase of 0.062 and 0.059 standard deviations the average sociability and academic achievement of friends, respectively. All of these estimates are statistically significant at the 1% level.

## 5 Outcomes and Empirical Strategy

### 5.1 Outcomes

In this section I describe the outcomes of my study. These are grouped into two broad categories according to the type of skill affected: social skills or academic outcomes. Social skills outcomes

are measured using networks, psychological self-reported instruments, and peers' perception of students according to different characteristics. Academic outcomes are measured by school grades and test scores collected by the Ministry of Education.

### 5.1.1 Social Skills Outcomes

The first set of outcomes corresponds to measures of social skills. Finding reliable measures of social skills is a big challenge. I use three categories of social skills outcomes: network surveys, psychological self-reported tests, and peers' perception measures.

My first outcome is the one that I used to classify students by sociability: the centrality level of the social network after the intervention. I also look at the number of connections. As was described above, I collected two waves of networks surveys the intervention. Students list their friends, their study partners, and their play-mates in sports and games. I construct a global network aggregating all the questions in the two waves. Like other studies in networks (Breza and Chandrasekhar, 2019; Banerjee et al., 2013, 2014), I consider an undirected network, but my results are robust to mutual connections.

I also measure social skills using self-reported psychological tests. My primary outcome is as a social skills index, using the first component of a Principal Component Analysis (PCA) on the entire set of tests. These tests include extraversion and agreeableness of the "Big Five", altruism, empathy, leadership, emotional intelligence, intercultural sensitivity, and the "Reading the mind in the eyes test". All the details for these tests are described in Appendix C.

To account for potential biases in self-reported answers, I include peers' perception of personal social skills as the third type of social outcome. While self-reported psychological tests are frequently used to measure social skills, they are subject to social desirability bias and can be manipulated by the respondent. Since social skills are important for interactions with peers, we also included questions of how peers perceive students.[10] This is additionally supported by empirical evidence which shows that relying on the perceptions of members of the same community relaxes information asymmetries (Hussam et al., 2017). Students were asked to rank up to five of their peers in four dimensions of social skills: leadership, friendliness, popularity, and shyness (reversed). I construct an index of peers' perception using the number of peers that nominate the student in each category.

I reproduce similar measures of social skills with the available social skills measures at baseline. Panel B in Appendix Figure A.1 displays a scatter-plot of the two general measures of social skills before and after the intervention. There is a large, positive correlation between the two measures. An OLS regression shows that one standard deviation in the social skills index at baseline correlates with a 0.43-standard-deviation increase in the social skills index after the intervention.

### 5.1.2 Academic Outcomes

Teachers assign grades to students for each subject based on their homework and test scores during the first three quarters of the year. These variables are only available for the 2016–17 cohorts. The Ministry relies on the grades of the International Baccalaureate (IB) degree for

[10] This was also the case in the baseline survey, as described in Appendix A.

the 2015 cohort and I do not have access to the final scores.[11]

Besides, students in the 2016–17 cohorts were also assessed via standardized tests designed by the Ministry of Education. These tests determine the students' grades for their final quarter at school. For the 2015 cohort, these test scores are not available since the Ministry only relies on the IB grades.

As described in section 3, the more sociable peers treatment is only available for the 2015–16 cohorts. Likewise, test scores and grades are only available for the 2016–17 cohorts. Appendix Table A.7 reconciles both sets of information, and indicates which cohorts were used for each treatment–outcome combination. I still use all the cohorts to estimate the impact of the higher-achieving peers treatment on social skills.

### 5.2 Empirical Strategy

I begin by estimating the effect of my two treatments—more sociable and higher-achieving peers—on the social skills and academic outcomes described in section 5.1. The following equation estimates the impact of each treatment:

$$y_{i\tau} = \alpha + \lambda_s s_{i\tau} + \lambda_c c_{i\tau} + \gamma_\tau + \varepsilon_{i\tau}. \tag{7}$$

Equation 7 shows how the more sociable peers treatment, $s_{i\tau}$, and the higher-achieving peers treatment, $c_{i\tau}$, affect the outcome, $y_{i\tau}$, of individual $i$ of student type $\tau$. I include student type fixed effects, $\gamma_\tau$, because the likelihood of receiving the treatments varies by student type. The parameters of interest in this equation, $\lambda_s$ and $\lambda_c$, the causal impact of the more sociable and higher-achieving peers treatments, respectively. I include the same set of controls as the ones in the balance tests of section 4. The standard errors are clustered at the student type$\times$*group of peer* level, since all the students within this unit share the same treatment peers. I also report the randomization inference p-values for my main results (Athey and Imbens, 2017; Young, 2017).

To estimate heterogeneous effects by gender, I also estimate equation 7 including the interaction of the two treatments with a *boy* dummy variable. The following equation describes this model,

$$y_{i\tau} = \alpha + \lambda_s s_{i\tau} + \lambda_c c_{i\tau} + \phi_s s_{i\tau} \times boy_i + \phi_c c_{i\tau} \times boy_i + \gamma_\tau + \varepsilon_{i\tau}, \tag{8}$$

where $\phi_s$ and $\phi_c$ are the differentiated impacts of each treatment for boys.

Estimates of equation 7 and equations 6a and 6b are of independent interest. They also are the Reduced Form and the First Stage of an IV estimate of the effect of peers' abilities. I estimate the effect of a one-standard-deviation in peers' average characteristics (i.e. neighbors' sociability and academic achievement) on students' outcomes. I use the experimental variation in my study in a two-endogenous model, and jointly estimate the effect of peers' characteristics on the social skills and academic outcomes of students. The following equation introduces my two-endogenous model:

$$y_{i\tau} = \theta + \beta_s \overline{s}_{n_{i\tau}} + \beta_c \overline{c}_{n_{i\tau}} + \gamma_\tau + \varepsilon_{i\tau}, \tag{9}$$

where $\overline{s}_{n_{i\tau}}$ and $\overline{c}_{n_{i\tau}}$ denote the average baseline sociability and academic achievement of student $i$ of type $\tau$. For small dormitories (less than 5 students), I define neighbors as peers in the

[11] I have preliminary scores, but these are unreliable, as the final scores usually do not coincide with these.

same room. For larger dormitories (more than 5 students), neighbors are defined as having the same or the adjacent bunk bed. The parameters of interest are $\beta_s$ and $\beta_c$; the effect of a one standard deviation in the average sociability and academic achievement of neighbors on students' outcomes. The first stage of this model is depicted in equations 6a and 6b. It represents the impact of the assignment to treatment on neighbors characteristics.

As described in section 4, Columns 7 and 8 of Table 3 display the estimates of equations 6a and 6b. Being assigned to live with more sociable peers increases the average sociability of neighbors by 0.55 standard deviations, and the higher-achieving peers treatment increases the average academic achievement of neighbors by 0.59 standard deviations.

## 6 Main Results

This section describes the impact of the intervention on students' academic and social skills outcomes. I first present the reduced-form estimates on social skills, then the reduced-form estimates on academic outcomes. Finally, I present the 2SLS estimates using the experimental variation as an instrument for neighbors' sociability and academic achievement at baseline.

### 6.1 Social Skills Outcomes

My description of the results starts by reporting the impact of my two treatments—the more sociable peers treatment and the higher-achieving peers treatment—on network measures, social-psychological tests, and peers' perception. Panel A of Table 4 reports the reduced-form estimates of equations 7 and 8 for all students on all of my social outcomes indicators.

The results reveal that having more sociable peers has a positive impact on social outcomes, but only for boys. Columns 1 and 2 in Panel A report the post-intervention effects on the number of connections after the intervention for all the students. The impact of more sociable peers on the number of links for all the students is a precise zero (0.001, p-value 0.995). However, as shown by column 2, this average impact masks some heterogeneity by gender. While the impact is negative for girls (-0.289, p-value 0.112), the effect is large and positive for boys, who end up having 0.411 (p-value 0.072) more connections after the intervention. The results for the network centrality (columns 3 and 4) reveal a similar pattern. More sociable neighbors reduce the centrality of girls (-0.030, p-value 0.181) and increase it for boys (0.100, p-value 0.009).

I also find that more sociable neighbors increase the social outcomes of boys only, as captured by their psychological tests (columns 5 and 6) and their peers' perception (columns 7 and 8). Columns 5 and 7 show an average treatment effect of 0.073 s.d. (p-value 0.007) on the psychological tests, and of 0.033 s.d. (p-value 0.098) on peers perception. However, these positive effects are mainly driven by boys. For them, social neighbors increase the social skills psychological index by 0.158 s.d. (p-value 0.000), and the peers' perception index by 0.054 s.d. (p-value 0.088).

By contrast, I do not find that higher-achieving peers affect social outcomes neither for boys nor girls. Overall, the estimates for all the students in Panel A are precise zeros. This is true for the network centrality measure (column 3, effect of 0.033 s.d., s.e. 0.024), the psychological index (column 5, effect of 0.001 s.d., s.e. 0.027), and the peers' perception (column 7, effect of 0.025 s.d., s .e. 0.021). For every single social measure both the point estimates and the

standard errors are small. I also find no differences by gender when I test for heterogeneous impacts (the even columns of Table 4).

Next, I explore whether these effects are heterogeneous by students' sociability at baseline. To do this I estimate equations 7 and 8 by subgroups: less and more sociable students at baseline (Panels B and C, respectively). I then compare the results for my subgroups to the estimates of equation 7 for all students, presented in Panel A.

The positive effects of the more sociable neighbors on the social skills of boys are mainly coming from the impact on the less sociable students. Comparing the results in Panels A and B of Table 4 shows that the positive effects of more sociable peers on social skills come mostly from boys who were less sociable at baseline. In particular, more sociable peers increase the connections of less sociable students by 0.805 (p-value 0.006). The estimates on network centrality, psychological tests, and peers' perception are all consistent with this conclusion. All of the point estimates are larger than the ones in Panel A, and the p-values have a range between 0.001 and 0.013. On the contrary, I do not find robust evidence that more sociable neighbors affect social outcomes of less sociable girls. Higher-achieving neighbors also appear not to affect social outcomes of less sociable students. They seem to reduce the social perception of less sociable girls, though. However, I do not over-interpret this result as it is not consistent with the effect on other social outcomes.

The more sociable peers treatment does not affect the formation of social skills for students assessed as more sociable at baseline. Panel C supports this general conclusion by showing the reverse side of the story. In general, I cannot reject a zero treatment effects for most of the outcomes in this table for both boys and girls. Higher-achieving peers, on the other hand, appear to increase the social perception of lower-achieving girls. As this effect is not consistent with other social outcomes, I refrain myself from drawing general conclusions from these estimates.

Overall, these results show that more sociable peers can enhance the formation of social skills. However, these positive effects are detected for boys only and especially those with lower sociability at baseline.

### 6.2 Academic Outcomes

Table 5 reports treatment effects on academic outcomes based on the estimation of equations 7 and 8. Columns 1 and 2 report the effects for grades in math and reading comprehension. Analogously, columns 3 and 4 show the impact of each treatment on math and reading test scores.

Consistent with the peer effects estimates reported by quasi-experimental studies (Angrist and Lang, 2004; Duflo et al., 2011; Abdulkadiroğlu et al., 2014) that generate large variation in peers' skills, I find that the impact of higher-achieving peers on students' academic achievement is a precise zero. The odd columns in Panel A of Table 5 present the ATEs for all students in my sample. This is a well-defined estimate in the context of my study. The 95% confidence interval for math test scores ranges between -0.070 and 0.012 standard deviations. For reading, it ranges between -0.094 and 0.014 standard deviations. Overall, these confidence intervals allow me to rule out positive peer effects on the average student. Likewise, I do not find evidence that having more sociable peers affects the formation of academic achievement for the average student. I also cannot reject homogeneous treatment effects by gender.

Next, I examine heterogeneity in treatment effects by academic achievement. I estimate equations 7 and 8 for two subgroups of academic achievement: lower- and higher-achieving students. Panels B and C of Table 5 report the reduced-form estimates for lower- and higher-achieving students at baseline.

I find that higher-achieving peers have heterogeneous treatment effects on academic achievement. Columns 1 and 3 in Panel B of Table 5 show that the higher-achieving peers treatment has a negative effect on grades for both math and reading comprehension. Higher-achieving neighbors decrease students' math grades by 0.086 s.d. (p-value 0.018), and reading grades by 0.062 s.d. (p-value 0.082). I also explore the impact on test scores of lower-achieving students. Columns 5 and 7 of Table 5 show that the effects of higher-achieving peers on lower-achieving students are negative and significant for both math (-0.060 with a p-value of 0.028) and reading comprehension (-0.072 with a p-value of 0.053). For the more sociable peers treatment, there is no consistent evidence that it affects academic performance. I do find a negative impact on math scores in column 5 of Panel B (-0.069, p-value 0.095), though.

The negative academic peer effects on lower-achieving students are starker for girls. The even columns in Panel B, Table 5 reports the estimates of equation 8 for lower-achieving students. Overall, these results show that for lower-achieving girls, the treatment academic effect is particularly negative, as reflected in math grades (column 2, -0.139 s.d., p-value 0.005), math test scores (column 6, -0.068 s.d., p-value 0.034), and reading test scores (column 8, -0.129 s.d., p-value 0.009). For reading grades (column 2), the point estimate is also negative, but it is more negative for boys. This result is not consistent across multiple outcomes and the same for the negative effect of more sociable neighbors on math scores in column 6. Overall, this evidence suggests that higher-achieving neighbors can harm the academic performance of lower-achieving girls. For the lower-achieving boys, I cannot generally reject the null hypothesis of a zero impact.

For the higher-achieving students at baseline, I do not find that neither more-sociable or higher-achieving neighbors affect academic performance. Panel C in Table 5 reports these estimates. Overall, in most cases, the estimates are small and fairly precise. This is true for grades and test scores, as well as for boys and girls (even columns in Table 5). In the context of my experiment, the characteristics of neighbors do not to affect the performance of the strongest students.

In summary, higher-achieving peers have, on average, a zero effect on students' academic outcomes. However, they appear to be detrimental to the performance of lower-achieving students, and especially lower-achieving girls.

### 6.3 2SLS Estimates

To account for imperfect compliance between assigned peers and actual neighbors, and provide more compatible estimates to other peer effects studies, I estimate equation 9. Tables 6 and 7 present the results of the 2SLS two-endogenous model described by equation 9 on social and academic outcomes for different groups.The table reports the estimates of parameters $\beta_s$ and $\beta_c$, the impact of neighbors' average sociability and academic achievement on students' outcomes. There are two endogenous variables: neighbors' sociability and neighbors' academic achievement (both calculated at baseline). I instrument for these variables using indicators for whether the student was assigned to the more sociable or the higher-achieving peers treatment. Table 6 has

a social skills index based on all the measures of social outcomes as the dependent variable. Table 7 reports the 2SLS estimates for math scores (Panel A) and reading scores (Panel B).

I find that neighbors' sociability has a positive impact on social skills, but only for boys. Columns 1 to 3 of Table 6 shows the results for all students, boys, and girls. A one-standard-deviation increase in neighbors' sociability has a 0.142-standard-deviation impact (p-value 0.004) on the social skills index for the average student (column 1). This positive impact comes from the effect on boys in column 2, with an estimate of 0.340 s.d. (p-value 0.000). By contrast, column 3 shows that the social peer effects estimate on girls is small (0.035), and precise (s.e. 0.055).

These positive social peer effects on boys are driven by the impact on the less sociable students in sociability at baseline. Columns 4 to 6 show the results for the less-sociable students. For every group, the estimates are larger than for the combined sample in columns 1 to 3. The most affected group are the less sociable boys. A one-standard-deviation in neighbors' sociability increases the social skills index of the less sociable boys by 0.464 s.d. (p-value 0.000) . Even though the impact on less sociable girls reported in column 6 is positive (0.093), I cannot reject that it is equal to zero.

More sociable neighbors have no impact on the strongest students, except for boys (columns 7 to 9). Column 7 reports an average social peer effect of 0.066 s.d. (p-value 0.302) for the more sociable students at baseline. However, the effect is positive for the more sociable boys, as depicted by column 8 which shows an impact of 0.289 s.d. (p-value 0.038). This estimate is smaller and weaker than the impact on the less sociable boys, though. Contrarily, the result for more sociable girls is zero and precise (column 9, -0.029 s.d., p-value 0.685).

Overall, I do not find that the academic achievement of neighbors has an impact on the social skills of students. The general point estimate in column 1 is very close to zero -0.005, and reasonably precise with a standard error of 0.044. When I look into this equation by gender and baseline sociability, I cannot generally reject a zero effect, with the exception of a negative estimate on the more sociable boys (column 8, -0.276 s.d., p-value 0.032). The reduced form estimates in Panel C of Table 4 suggest that the psychological tests are driving this negative effect.

Table 7 reports peer effects estimates of equation 9 on academic outcomes. Panel A presents the results for test scores in math and Panel B for test scores in reading. Overall, column 1 shows a precise zero estimate of average academic peer effects. The impact of one standard deviation in neighbors' academic achievement at baseline is -0.044 (s.e. 0.035) on math and -0.069 (s.e. 0.046) on reading scores. I also find fairly precise estimates of neighbors' sociability on academic outcomes, and columns 2 and 3 do not reveal differences by gender.

The results in columns 4 and 6 of Table 7 show that academic peer effects are negative for lower-achieving students, and in particular for girls. Column 4 reports that a one-standard-deviation increase in the academic achievement of neighbors decreases math scores by 0.102 s.d. (Panel A, p-value 0.039), and reading scores by 0.124 s.d. (Panel B, p-value 0.059). Column 6 shows that academic peer effects are more negative for lower-achieving girls. A one-standard-deviation increase in the admission scores of neighbors decreases math scores by 0.115 s.d. (p-value 0.034), and reading scores by 0.213 s.d. (p-value 0.010) for lower-achieving girls.

In summary, the conclusions from the 2SLS model are analogous to those arrived by using

the reduced-form estimates. The estimates are still precise enough to rule out positive peers on academic performance. However, the sociability of neighbors does favor the development of social skills among less sociable boys. Likewise, the evidence suggests that having higher-achieving neighbors has a detrimental effect on the academic achievement of lower-achieving students, and especially girls.

The 2SLS estimates are also convenient to inform optimal policies, by a social planner, that allocates students to dormitories. As I find heterogeneous peer effects estimates by gender, these policies are gender-specific. To maximize the average level of social outcomes in a group of students, the social planner should mix boys by their initial level of sociability. This solution is explained by the fact that less sociable boys are the ones who benefit the most from more sociable neighbors. We would derive the same conclusion for any policy function that is meant to reduce inequality in social skills within schools. By contrast, as lower-achieving girls are affected the most by higher-achieving neighbors, optimal policies should consider girls' initial levels of academic achievement. Since higher-achieving girls reduce the performance of lower-achieving ones, it would be optimal to separate them in the allocation to dormitories.

These optimal policies are exclusively based on peer effects estimates, and they ignore other potential drivers of the results in this paper. In the next section, I explore whether gender differences in psychological factors and social interactions can explain my findings.

## 7 Mechanisms

Next, I explore potential mechanisms to explain my results. I consider two mechanisms: differences by gender in psychological factors and social interactions.

### 7.1 Beliefs in Personal Ability and Preferences for Competition

In this section, I study whether differences by gender in self-confidence and preferences for competition can explain my results.

There is evidence in economics showing that men are less conservative than women when they update their beliefs in oneself (Mobius et al., 2014). Therefore, by interacting with more sociable neighbors, girls and boy might have different beliefs in their skills. Likewise, there is a vast literature showing than women are more averse to competition than men (Gneezy et al., 2003; Niederle and Vesterlund, 2007). Differences in preferences for competition might explain the gender gap in career decisions and labor market outcomes (Buser et al., 2014). More important for my results, some evidence shows that women are more likely than men to stop competing when they lose (Buser and Yuan, 2019). Hence, social comparison of boys and girls with their neighbors might drive differentiated effects by gender. Girls could get more easily discouraged than boys after these comparisons.

I start studying whether boys and girls have different beliefs in their social skills due to more sociable neighbors. I measure beliefs by considering whether a student identifies herself as part of the top 5 of leadership, friendliness, popularity, and shyness (reversed) in their cohorts. I take the sum of all these categories. In the endline survey, we also asked students to report their believed ranking in popularity between zero and one hundredth, with higher scores being more popular. Table 8 reports the impact of more sociable neighbors on beliefs in oneself social skills. Panel A presents the results for the less sociable students, and Panel B for the more sociable.

Columns 1 and 2 show the effect on recognition as a social person, and columns 3 and 4 on the popularity ranking.

More sociable neighbors increase self-recognition as a social person for the less sociable boys but decrease this self-recognition for the less sociable girls. Column 1 in Panel A shows the average impact on the less sociable students at baseline -0.020 (p-value 0.597). However, as it is revealed by column 2, this average effect masks gender heterogeneity. While the self-recognition index decreases by 9.1 points for girls (p-value 0.032), it increases by 13.7 points (p-value 0.026 for boys). By contrast, the results in Panel C show that there are no peer effects on self-recognition as a social person, neither for more sociable boys or girls. The results on the popularity index are similar and consistent. Less sociable girls respond negatively to more sociable neighbors with a self-reported ranking 2.75 (p-value 0.051) positions below. On the contrary, boys react positively with a ranking 2.59 above (p-value 0.101). Remarkably, I can reject the null hypotheses that the effects for boys and girls are the same on both variables.

This evidence suggests that more sociable neighbors affect the beliefs differently that boys and girls have in their ability. It is important to point out that I cannot disentangle whether these effects are explained by differences in the updating process, or the type of signal that students receive. On the one hand, boys and girls can receive different signals due to gender-specific peer interactions. On the other hand, conditional on receiving the same signal, boys and girls can have a different belief updating process. As I will discuss later, I cannot reject that social interactions between less sociable students and more sociable neighbors differ by gender. Hence, this can be read as suggestive evidence that less sociable boys and girls respond differently after having similar interactions.

Next, I explore what drives my results on academic peer effects. I test two mechanisms: self-confidence in academic skills and preferences for competition. To measure self-confidence in academic skills, I use two variables to measure beliefs in academic ability. The first variable is whether the student nominates herself among the top 5 of the most skilled students in her cohort. The second variable is her self-reported academic ranking. To measure preferences for competition, I use the *Achievement Goal Questionnaire*.[12] Two of the factors of this questionnaire involve preferences for competition. The first one is whether the student wants to perform better than other students, and the second one, whether she avoids doing worse than her peers. Table 9 reports the results for all these variables. Panel A presents the results for the lower-achieving students, and Panel B for the higher-achieving.

I find that self-confidence in academic abilities is not a valid mechanism for the peer effects estimates. The results in columns 1 to 4 of Table 9 show the effects of the two treatments on beliefs in academic skills. I cannot reject that these effects are equal to zero for lower- and higher-achieving students, as well as for boys and girls. The only significant impact of higher-achieving peers seems to be to reduce the likelihood that lower-achieving boys self-nominate as one of the five most skilled in their cohort (column 2). This result is not consistent with the impact on the self-reported academic ranking (column 4), though.

By contrast, the effects on preferences for competition are consistent with the evidence on academic peer effects discussed above. Column 6 shows that when paired with higher-achieving neighbors, lower-achieving girls are less likely to report that they want to do better than their

[12]The details of the test are discussed in Appendix C.

peers by 0.514 points (p-value 0.003). The estimate on avoiding doing worse than their peers is consistent with a negative effect of 0.711 points (p-value 0.047). This result is consistent with the evidence in the literature that shows that women are more discouraged by competition when they lose than men (Buser and Yuan, 2019).

In general, the results in this section suggest that gender differences in psychological factors are consistent with the peer effects estimates in section 6. For the social peer effects, I find that less sociable boys have higher beliefs in their social skills when paired with more sociable neighbors. I find the opposite result for the less sociable girls. While self-confidence is not a valid mechanism for the academic peer effects estimates, discouragement from competition due to social comparisons seems to be.

### 7.2 Social Interactions

Intuitively, peer effects estimates of friends should be different than from other peers. For example, Carrell et al. (2013) find that peers that were supposed to increase the performance of low-skilled students end up harming them due to changes in social and study networks. When low-skilled students are in groups with high skilled peers, there is segregation by academic achievement, and the performance of the low-skilled students is worse. Given this evidence on the importance of social interactions for the direction and magnitude of peer effects, I test whether this is a valid mechanism for my results.

To study the role of social interactions, I go back to the evidence in section 3. I test whether the impact of the distance on the list is different for the most affected groups versus other comparable students. In particular, I estimate the following equation and test for equal effects of distance dummies:

$$y_{ij} = \gamma_0 + \sum_{k=1}^{5} \gamma_k \mathbf{1}_{d=k_{ij}} + \nu_{ij}, \tag{10}$$

where $y_{ij}$ is a dummy variable equal to one when students $i$ or $j$ report being friends, studying, or playing with each other. The variable $\mathbf{1}_{d=k_{ij}}$ denotes a dummy variable equal to one when the distance between students $i$ and $j$ on the list is equal to $k$. I consider only values for distances between 1 and 5 as it Figure 4 shows that those values have an impact of being neighbors in dormitories.[13]. I estimate equation 10 for the most affected groups with their respective neighbors as well as for comparable students.

Different patterns of social interactions do not explain my estimates of social peer effects. Panel A of figure 5 reports the estimates of equation 10 for less sociable boys with more sociable neighbors, less sociable boys with less sociable neighbors, and less sociable girls with more sociable neighbors. Overall, the impact of distance on social interactions is similar for the three groups. Furthermore, I cannot reject an equal effect of distance dummies on social interactions for the three groups. The p-value of the comparison between less sociable boys with more sociable neighbors and less sociable boys with less sociable neighbors is 0.572. The p-value of heterogeneity of distance on social interactions between less sociable boys and girls with more sociable neighbors is 0.684. In general, all three groups appear to form similar connections. Hence, the fact that sociable neighbors increase social skills of less sociable boys is not explained by social interactions with neighbors.

[13]Besides, there are only a few observations for distances larger than five.

Social interactions do not explain my estimates of academic peer effects neither. Panel B of Figure 5 reports estimates for lower-achieving girls with higher-achieving neighbors, lower-achieving girls with lower-achieving neighbors, and lower-achieving boys with higher-achieving neighbors. For the three groups, I find that the impact on distance on social interactions is similar. This result is also consistent when I just look at the study networks. In my study, even though lower-achieving girls interact with higher-achieving neighbors, they still experience declines in academic achievement.

## 8 Evidence on Hard Outcomes

There is a broad literature showing the importance of social skills (Deming, 2017; Weinberger, 2014) as well as other non-cognitive skills (Heckman et al., 2006; Heckman and Kautz, 2013) for labor market outcomes. However, it is still difficult to assess whether the results derived in this paper would have later-life consequences. In this section, I address this concern. First, I show that my measures of social skills have a positive correlation with college outcomes. Second, I study whether the intervention did change hard outcomes for the less sociable boys.

I consider three measures of hard outcomes: dropout rates, college enrollment, and college quality. The COAR Network directly measures dropout rates. To measure college outcomes, I use data collected by the Ministry of higher-education institutions. While the higher education sector in Peru includes colleges and technical education, the Ministry only includes colleges in this data set. I had access to this data nine months after the 2016 cohort graduated from the COAR Network. Therefore, I have college outcomes for two cohorts in my sample, and these two were the ones with the social treatment. Besides enrollment, I also use a measure of college quality. In particular, due to a new law issued in 2014, all colleges need to fulfill a minimum requirement of quality to receive a certification of the Government. By 2019, only 73 institutions have been certified. I use this certification as a measure of college quality.

Panel A of Table 10 shows that social skills correlate with college enrollment and quality. Neither social skills, math scores, or reading scores affect dropouts (column 1). However, social skills and math scores predict both college enrollment (column 3), and college quality (column 5). On the contrary, reading scores do not correlate with college outcomes. A one-standard-deviation in social skills correlates with 1.6 percentage points increase in college enrollment. This is one-quarter of the correlation of college enrollment and math scores. The results are more notorious for college quality, where the correlation of social skills is 36% of the correlation of math scores.

Furthermore, the results in Panel B show that more sociable neighbors also influence hard outcomes of the less sociable boys. Column 1 shows a negative effect of 2.3 p.p. (p-value 0.007) on the dropout rate. Column 5 shows an increase by 4.8 p.p. (p-value 0.028) on the likelihood of enrolling at certified institutions. Both effects are weaker when I control for the centrality in the network after the intervention (column 2), and the psychological variables and peers' perception of social skills (column 6). This evidence suggests that social skills are an essential skill to acquire for later-life outcomes. Furthermore, by interacting with sociable peers, students can develop these social skills.

## 9 Conclusion

While there is a positive return to social skills in the labor market, there is still little evidence on how social skills form. This paper presents the results of a field experiment designed to estimate causal academic and social peer effects. The study was conducted in 23 out of 25 exam schools in Peru, covering a sample of approximately 6,000 students. Students were classified by baseline sociability and academic achievement using centrality measures of social networks and test scores. Unlike previous experimental designs, my experiment guarantees strong variation in peer characteristics by randomizing the type of peer and matching students to peers of their treatment groups.

I found that more sociable peers have a positive impact on the development of social skills, but only for boys. These effects are mainly driven by the impact on those boys who were assessed as less sociable at baseline. My results show that they end up with more friends and a higher centrality or influence in their networks. These results are consistent with the impact on psychological tests and peers' perception of their social skills. Furthermore, I find that some of these effects translate into hard outcomes. More sociable neighbors prevent less sociable boys from dropping out of the COAR Network. They also increase their enrollment at better colleges.

By contrast, I do reject positive academic peer effects on academic achievement. For students who were lower achieving at baseline, the evidence suggests that higher-achieving peers have a negative effect. This result is stronger for lower-achieving girls. My results are not consistent with peer effects estimates from other studies, especially the ones that use random allocation to groups (Sacerdote, 2011; Epple and Romano, 2011). I cannot disentangle whether these differences are due to specific conditions of my context, or methodological differences in the empirical design. However, my conclusions are similar to the evidence on peer effects from quasi-experimental studies (Angrist and Lang, 2004; Abdulkadiroğlu et al., 2014; Duflo et al., 2011), that also ensure substantial variation in peers' skills.

A potential limitation of this paper is that it does not allow for non-linearities in peer effects. However, while the main estimation is based on a linear-in-means peer effects model, I do allow for heterogeneity by gender and baseline characteristics. Furthermore, the main objective of the experimental design was to generate strong variation in peers skills. While it would be possible to estimate non-linearities by including more treatment groups —for example, dividing the sample by terciles—, this can be costly in terms of statistical power.

Overall, the results show that the impact of policies that affect peer characteristics largely depends on gender. The beliefs in social skills of less sociable boys and less sociable girls respond differently to interactions with more sociable neighbors. These results are consistent with a broad literature studying how men and women differ in the formation of beliefs about oneself and others. The results on academic peer effects are also compatible with the evidence showing that women are more discouraged by competition than men.

I also rule out social interactions as a mechanism behind the main effects. The impact on less sociable boys is not because they interact more with their sociable neighbors than other groups. Likewise, although lower-achieving girls are interacting and studying with their higher-achieving neighbors, they experience a decline in academic achievement. This result contradicts previous evidence in the literature, which suggests students only benefit from higher-achieving peers when they are interacting with them (Carrell et al., 2013). Hence, more studies are needed

to understand the differences between peer effects from friends and others.

To answer the motivating question of this study, I find evidence that social skills can be formed by interacting with more sociable people. However, this positive impact depends on how boys and girls respond to peer interactions and form beliefs about their abilities. Further studies are needed to assess whether these results are valid in other contexts.

## References


Abdulkadiroğlu, A., Angrist, J., and Pathak, P. (2014). The Elite Illusion: Achievement Effects at Boston and New York Exam Schools. *Econometrica*, 82(1):137–196.

Adhvaryu, A., Kala, N., and Nyshadham, A. (2018). The Skills to Pay the Bills: Returns to On-the-job Soft Skills Training. Working Paper 24313, National Bureau of Economic Research.

Akee, R., Copeland, W., Costello, E. J., and Simeonova, E. (2018). How does household income affect child personality traits and behaviors? *American Economic Review*, 108(3):775–827.

Almlund, M., Duckworth, A. L., Heckman, J., and Kautz, T. (2011). Chapter 1 - personality psychology and economics1. In Hanushek, E. A., Machin, S., and Woessmann, L., editors, *Handbook of The Economics of Education*, volume 4 of *Handbook of the Economics of Education*, pages 1 – 181. Elsevier.

Angrist, J. D. (2014). The Perils of Peer Effects . *Labour Economics*, 30:98 – 108. Special Section articles on "What determined the dynamics of labour economics research in the past 25 years? edited by Joop Hartog and and European Association of Labour Economists 25th Annual Conference, Turin, Italy, 19-21 September 2013 Edited by Michele Pellizzari.

Angrist, J. D. and Lang, K. (2004). Does school integration generate peer effects? evidence from boston's metco program. *American Economic Review*, 94(5):1613–1634.

Arli, S. K. and Bakan, A. B. (2018). An investigation of the relationship between intercultural sensitivity and compassion in nurses. *International Journal of Intercultural Relations*, 63:38 – 42.

Athey, S. and Imbens, G. (2017). Chapter 3 - the econometrics of randomized experimentsa. In Banerjee, A. V. and Duflo, E., editors, *Handbook of Field Experiments*, volume 1 of *Handbook of Economic Field Experiments*, pages 73 – 140. North-Holland.

Autor, D. (2014). Polanyi's paradox and the shape of employment growth. Working Paper 20485, National Bureau of Economic Research.

Banerjee, A., Chandrasekhar, A. G., Duflo, E., and Jackson, M. O. (2013). The diffusion of microfinance. *Science*, 341(6144).

Banerjee, A., Chandrasekhar, A. G., Duflo, E., and Jackson, M. O. (2014). Gossip: Identifying central individuals in a social network. Working Paper 20422, National Bureau of Economic Research.

Beaman, L. and Dillon, A. (2018). Diffusion of agricultural information within social networks: Evidence on gender inequalities from mali. *Journal of Development Economics*, 133:147 – 161.

Belloni, A., Chernozhukov, V., and Hansen, C. (2014a). High-dimensional methods and inference on structural and treatment effects. *Journal of Economic Perspectives*, 28(2):29–50.

Belloni, A., Chernozhukov, V., and Hansen, C. (2014b). Inference on treatment effects after selection among high-dimensional controls†. *The Review of Economic Studies*, 81(2):608–650.

Boisjoly, J., Duncan, G. J., Kremer, M., Levy, D. M., and Eccles, J. (2006). Empathy or antipathy? the impact of diversity. *American Economic Review*, 96(5):1890–1905.

Bordalo, P., Coffman, K., Gennaioli, N., and Shleifer, A. (2019). Beliefs about Gender. *American Economic Review*, 109(3):739–73.

Breza, E. and Chandrasekhar, A. G. (2019). Social networks, reputation, and commitment: Evidence from a savings monitors experiment. *Econometrica*, 87(1):175–216.

Bursztyn, L., Egorov, G., and Jensen, R. (2018). Cool to be smart or smart to be cool? understanding peer pressure in education. *The Review of Economic Studies*, page rdy026.

Bursztyn, L. and Jensen, R. (2015). How does peer pressure affect educational investments? *. *The Quarterly Journal of Economics*, 130(3):1329.

Buser, T., Niederle, M., and Oosterbeek, H. (2014). Gender, Competitiveness, and Career Choices . *The Quarterly Journal of Economics*, 129(3):1409–1447.

Buser, T. and Yuan, H. (2019). Do women give up competing more easily? evidence from the lab and the dutch math olympiad. *American Economic Journal: Applied Economics*, 11(3):225–52.

Caeyers, B. and Fafchamps, M. (2016). Exclusion bias in the estimation of peer effects. Working Paper 22565, National Bureau of Economic Research.

Carre, A., Stefaniak, N., D'Ambrosio, F., Bensalah, L., and Besche, C. (2013). The basic empathy scale in adults (bes-a): Factor structure of a revised form. 25:679–691.

Carrell, S., Fullerton, R. L., and West, J. (2009). Does your cohort matter? measuring peer effects in college achievement. *Journal of Labor Economics*, 27(3):439–464.

Carrell, S. E., Hoekstra, M., and West, J. E. (2015). The impact of intergroup contact on racial attitudes and revealed preferences. Working Paper 20940, National Bureau of Economic Research.

Carrell, S. E., Sacerdote, B. I., and West, J. E. (2013). From natural variation to optimal policy? the importance of endogenous peer group formation. *Econometrica*, 81(3):855–882.

Casner-Lotto, J. and Barrington, L. (2006). Are they Really Ready to Work? Employers' Perspective in the Basic Knowledge and Applied Skills of New Entrants to the 21st Century US Workforce. The Conference Board, New York, NY.

Castro-Solano, A. (2007). *Teoría y Evaluación dell Liderazgo*. Paidos.

Chen, G.-M. and Starosta, W. J. (2000). The development and validation of the intercultural sensitivity scale. *Human Communication*.

Cobb-Clark, D. A. and Tan, M. (2011). Noncognitive skills, occupational attainment, and relative wages. *Labour Economics*, 18(1):1 – 13.

Coffman, K. B. (2014). Evidence on Self-Stereotyping and the Contribution of Ideas . *The Quarterly Journal of Economics*, 129(4):1625–1660.

Colman, A. M. (2009). *A Dictionary of Psychology*.

Declerck, C. H. and Bogaert, S. (2008). Social value orientation: related to empathy and the ability to read the mind in the eyes. *The Journal of social psychology*, 148.

Deming, D. J. (2017). The growing importance of social skills in the labor market. *Quarterly Journal of Economics*, 132(4):1593–1640.

Donato, K., Miller, G., Mohanan, M., Truskinovsky, Y., and Vera-Hernández, M. (2017). Personality traits and performance contracts: Evidence from a field experiment among maternity care providers in india. *American Economic Review*, 107(5):506–10.

Duflo, E., Dupas, P., and Kremer, M. (2011). Peer effects, teacher incentives, and the impact of tracking: Evidence from a randomized evaluation in kenya. *American Economic Review*, 101(5):1739–74.

Epple, D. and Romano, R. E. (2011). Chapter 20 - Peer Effects in Education: A Survey of the Theory and Evidence . volume 1 of *Handbook of Social Economics*, pages 1053 – 1163. North-Holland.

Falk, A., Kosse, F., Deckers, T., Pinger, P., and Schildberg-Hörisch, H. (2018). The formation of prosociality: Causal evidence on the role of social environment. Technical report, University of Bonn.

Fletcher, J. M. (2013). The effects of personality traits on adult labor market outcomes: Evidence from siblings. *Journal of Economic Behavior & Organization*, 89:122 – 135.

Gambin, M. and Sharp, C. (2018). The relations between empathy, guilt, shame and depression in inpatient adolescents. *Journal of Affective Disorders*, 241:381 – 387.

Garlick, R. (2018). Academic peer effects with different group assignment policies: Residential tracking versus random assignment. *American Economic Journal: Applied Economics*, 10(3):345–69.

Gneezy, U., Niederle, M., and Rustichini, A. (2003). Performance in Competitive Environments: Gender Differences*. *The Quarterly Journal of Economics*, 118(3):1049–1074.

Gordon, S. R. and Mwavita, M. (2018). Evaluating the international dimension in an undergraduate curriculum by assessing students' intercultural sensitivity. *Studies in Educational Evaluation*, 59:76 – 83.

Heckman, J. J. and Kautz, T. (2013). Fostering and measuring skills: Interventions that improve character and cognition. Working Paper 19656, National Bureau of Economic Research.

Heckman, J. J., Stixrud, J., and Urzua, S. (2006). The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior. *Journal of Labor Economics*, 24(3):411–482.

Hoffman, M. and Tadelis, S. (2018). People management skills, employee attrition, and manager rewards: An empirical analysis. Working Paper 24360, National Bureau of Economic Research.

Hussam, R., Rigol, N., and Roth, B. (2017). Targeting high ability entrepreneurs using community information. Technical report, MIT M.

Ipshording, I. and Zölitz, U. (2019). The value of a peer.

J. Elliot, A. and Murayama, K. (2008). On the measurement of achievement goals: Critique, illustration, and application. 100.

Jerald, C. D. (2009). Defining a 21st Century Education. Center for Public Education.

John, O. P. and Srivastava, S. (1999). *Handbook of Personality: Theory and Research*, chapter The Big Five trait taxonomy: History, measurement, and theoretical perspectives, pages 102–138. Guilford Press, New York, second edition.

Jolliffe, D. and Farrington, D. P. (2006). Development and validation of the basic empathy scale. *Journal of Adolescence*, 29(4):589 – 611.

Kranton, R. E. and Sanders, S. G. (2017). Groupy versus non-groupy social preferences: Personality, region, and political party. *American Economic Review*, 107(5):65–69.

Law, K., Wong, C.-S., and J Song, L. (2004). The construct and criterion related validity of emotional intelligence and its potential utility for management studies. 89:483–96.

Manski, C. F. (1993). Identification of endogenous social effects: The reflection problem. *The Review of Economic Studies*, 60(3):pp. 531–542.

McCrae, R. R. and John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, 60(2):175–215.

Mehu, M., Grammer, K., and Dunbar, R. I. (2007). Smiles when sharing. *Evolution and Human Behavior*, 28(6):415 – 422.

Mobius, M. M., Niederle, M., Niehaus, P., and Rosenblat, T. S. (2014). "Managing Self-Confidence: Theory and Experimental Evidence". Technical report.

Niederle, M. and Vesterlund, L. (2007). Do Women Shy Away From Competition? Do Men Compete Too Much?*. *The Quarterly Journal of Economics*, 122(3):1067–1101.

Novella, R., Alvarado, A., Rosas, D., and González-Velosa, C. (2019). Encuesta de habilidades al trabajo (enhat) 2017-2018: Causas y consecuencias de la brecha de habilidades en perú. Technical Report IDB-TN-1652, Inter-American Development Bank.

Otto, P. E. and Bolle, F. (2011). Multiple facets of altruism and their influence on blood donation. *The Journal of Socio-Economics*, 40(5):558 – 563.

Rao, G. (2019). Familiarity does not breed contempt: Generosity, discrimination, and diversity in delhi schools. *American Economic Review*, 109(3):774–809.

Rushton, J. P., Chrisjohn, R. D., and Fekken, G. C. (1981). The altruistic personality and the self-report altruism scale. *Personality and Individual Differences*, 2(4):293 – 302.

Sacerdote, B. (2001). Peer effects with random assignment: Results for dartmouth roommates. *The Quarterly Journal of Economics*, 116(2):681–704.

Sacerdote, B. (2011). Chapter 4 - peer effects in education: How might they work, how big are they and how much do we know thus far? volume 3 of *Handbook of the Economics of Education*, pages 249 – 277. Elsevier.

Sacerdote, B. (2014). Experimental and quasi-experimental analysis of peer effects: Two steps forward? *Annual Review of Economics*, 6(1):253–272.

Sarsons, H. and Xu, G. (2016). Confidence Men? Gender and Confidence: Evidence among Top Economists. Technical report.

Villadangos, M., Errasti, J., Amigo, I., Jollife, D., and García-Cueto, E. (2016). Characteristics of empathy in young people measured by the spanish validation of the basic empathy scale. *Psicothema*.

Wai, M. and Tiliopoulos, N. (2012). The affective and cognitive empathic nature of the dark triad of personality. *Personality and Individual Differences*, 52(7):794 – 799.

Weinberger, C. J. (2014). The increasing complementarity between cognitive and social skills. *The Review of Economics and Statistics*, 96(5):849–861.

Woolley, A. W., Chabris, C. F., Pentland, A., Hashmi, N., and Malone, T. W. (2010). Evidence for a collective intelligence factor in the performance of human groups. *Science*, 330(6004):686–688.

Young, A. (2017). Channelling fisher: Randomization tests and the statistical insignificance of seemingly significant experimental results. Technical report, London School of Economics.

Yukl, G. (2013). *Leadership in Organizations*. Pearson, eighth edition edition.

TABLE 1: Summary Statistics at Baseline

| | All Students | By Sociability | | By Academic Achievement | |
|---|---|---|---|---|---|
| | | Less Sociable | More Sociable | Lower Achieving | Higher Achieving |
| Variable | (1) | (2) | (3) | (4) | (5) |
| Sociability | -0.00 | -0.64 | 0.64 | -0.04 | 0.04 |
| (centrality measure) | (1.00) | (0.51) | (0.96) | (0.99) | (1.01) |
| Academic achievement | 0.00 | -0.08 | 0.08 | -0.79 | 0.78 |
| (score in the admission test) | (0.99) | (0.96) | (1.02) | (0.47) | (0.71) |
| Poor (%) | 0.36 | 0.39 | 0.35 | 0.39 | 0.33 |
| Extremely poor (%) | 0.18 | 0.22 | 0.18 | 0.21 | 0.16 |
| Rural (%) | 0.26 | 0.31 | 0.23 | 0.30 | 0.22 |
| N | 6,147 | 1,832 | 1,822 | 3,069 | 3,078 |

**Notes:** This table reports summary statistics by type of student. Column 1 shows statistics for all students, and columns 2 to 5 according to the classification of students by social skills and academic performance. The table includes a set of three demographic characteristics of students, including poverty, extreme poverty, and whether the student comes from a rural household. These demographic variables come from government administrative data.

TABLE 2: Balance on Academic Performance and Social Skills at Baseline

| Dependent variable: | Social skills index | | | Math score | | | Reading score | | |
|---|---|---|---|---|---|---|---|---|---|
| | All students | Sociability | | All students | Academic achievement | | All students | Academic achievement | |
| | | Less sociable | More sociable | | Lower-achieving | Higher-achieving | | Lower-achieving | Higher-achieving |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| | | | | Panel A: All students | | | | | |
| More sociable | -0.019 | -0.016 | -0.024 | 0.019 | 0.019 | 0.020 | 0.011 | 0.022 | -0.000 |
| | (0.038) | (0.056) | (0.053) | (0.028) | (0.035) | (0.044) | (0.029) | (0.041) | (0.042) |
| Higher-achieving | 0.032 | 0.062 | 0.001 | 0.009 | -0.029 | 0.046 | 0.001 | -0.015 | 0.016 |
| | (0.038) | (0.055) | (0.052) | (0.025) | (0.032) | (0.037) | (0.025) | (0.035) | (0.035) |
| Control mean | -0.06 | -0.19 | 0.12 | -0.11 | -0.40 | 0.31 | -0.08 | -0.31 | 0.26 |
| N | 3,654 | 1,832 | 1,822 | 4,474 | 2,235 | 2,239 | 4,474 | 2,235 | 2,239 |
| | | | | Panel B: Boys | | | | | |
| More sociable | -0.071 | -0.094 | -0.047 | -0.004 | 0.014 | -0.022 | 0.009 | -0.019 | 0.037 |
| | (0.059) | (0.085) | (0.081) | (0.045) | (0.056) | (0.071) | (0.041) | (0.060) | (0.057) |
| Higher-achieving | -0.103* | -0.072 | -0.134 | 0.024 | -0.023 | 0.070 | 0.006 | 0.011 | 0.000 |
| | (0.059) | (0.085) | (0.082) | (0.040) | (0.051) | (0.062) | (0.035) | (0.049) | (0.051) |
| Control mean | -0.05 | -0.18 | 0.16 | 0.01 | -0.31 | 0.48 | -0.16 | -0.42 | 0.22 |
| N | 1,490 | 753 | 737 | 1,981 | 996 | 985 | 1,981 | 996 | 985 |
| | | | | Panel C: Girls | | | | | |
| More sociable | 0.016 | 0.040 | -0.007 | 0.036 | 0.022 | 0.050 | 0.012 | 0.052 | -0.028 |
| | (0.050) | (0.073) | (0.069) | (0.035) | (0.044) | (0.055) | (0.040) | (0.056) | (0.058) |
| Higher-achieving | 0.124** | 0.156** | 0.093 | -0.001 | -0.034 | 0.029 | -0.003 | -0.034 | 0.026 |
| | (0.049) | (0.072) | (0.067) | (0.031) | (0.040) | (0.046) | (0.034) | (0.049) | (0.048) |
| Control mean | -0.07 | -0.19 | 0.10 | -0.21 | -0.47 | 0.17 | -0.01 | -0.21 | 0.28 |
| N | 2,164 | 1,079 | 1,085 | 2,493 | 1,239 | 1,254 | 2,493 | 1,239 | 1,254 |

**Notes:** This table reports balance checks of being assigned to more sociable and higher-achieving peers on social skills and academic performance for all students and subgroups by sociability and academic achievement at baseline. All regressions include strata fixed effects and control for the baseline value of the dependent variable. For the 2017 cohort all regressions include strata-by-classroom fixed effects. Standard errors are clustered at the peer group type-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

TABLE 3: First Stage on Assigned Peers, Neighbors, and Friends

| | Assigned peers | | | | Neighbors | | | | Friends | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | | Baseline characteristics | | Number | | Baseline characteristics | | Number | | Baseline characteristics | |
| | More sociable | Higher achieving | Sociability | Academic achievement | More sociable | Higher achieving | Sociability | Academic achievement | More sociable | Higher achieving | Sociability | Academic achievement |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| More sociable | 3.175*** | -0.010 | 4.425*** | 0.089*** | 1.632*** | 0.005 | 0.556*** | 0.081*** | 0.472*** | -0.009 | 0.062*** | -0.009 |
| | (0.109) | (0.106) | (0.080) | (0.017) | (0.052) | (0.050) | (0.020) | (0.020) | (0.110) | (0.097) | (0.012) | (0.010) |
| Higher-achieving | 0.018 | 3.039*** | 0.212*** | 0.961*** | -0.054 | 1.632*** | 0.020 | 0.595*** | -0.123 | 0.438*** | -0.005 | 0.059*** |
| | (0.080) | (0.089) | (0.062) | (0.014) | (0.040) | (0.042) | (0.015) | (0.017) | (0.087) | (0.088) | (0.009) | (0.008) |
| Control mean | 0.38 | 0.92 | -2.05 | -0.53 | 0.61 | 1.38 | -0.13 | -0.36 | 2.83 | 6.28 | 0.03 | -0.06 |
| N | 6,019 | 6,019 | 6,019 | 6,019 | 6,019 | 6,019 | 6,019 | 6,019 | 6,019 | 6,019 | 6,019 | 6,019 |

**Notes:** This table reports the effect of being assigned to more sociable and higher-achieving peers identified at baseline on the number of more sociable and higher-achieving assigned peers, neighbors, and friends, and on the average sociability and academic achievement for each of these groups. Assigned peers are students in the *groups of peers* to which the student was assigned, neighbors are students in the same dormitory for small dorms and students in the same or adjacent bunk bed for large dorms. All regressions include strata fixed effects and control for the baseline value of the dependent variable. For the 2017 cohort all regressions include strata-by-classroom fixed effects. The control group is defined as being assigned to less sociable and lower-achieving peers. Standard errors are clustered at the peer group type-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

TABLE 4: Reduced-Form Estimates on Social Skills

| Dependent variable: | Connections | | Centrality | | Psychological tests | | Peers' perception | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Panel A: All students | | | | | | | | |
| More sociable | 0.001 | -0.289 | 0.023 | -0.030 | 0.073*** | 0.016 | 0.033* | 0.019 |
| | (0.143) | (0.181) | (0.024) | (0.029) | (0.027) | (0.033) | (0.020) | (0.026) |
| Higher-achieving | 0.086 | 0.016 | 0.033 | 0.012 | 0.001 | 0.014 | 0.025 | 0.042 |
| | (0.142) | (0.184) | (0.024) | (0.030) | (0.027) | (0.032) | (0.021) | (0.027) |
| More sociable × boy | | 0.699** | | 0.130*** | | 0.142** | | 0.035 |
| | | (0.291) | | (0.048) | | (0.056) | | (0.041) |
| Higher-achieving × boy | | 0.162 | | 0.049 | | -0.032 | | -0.043 |
| | | (0.291) | | (0.048) | | (0.055) | | (0.042) |
| mean control | 14.57 | 14.57 | -0.05 | -0.05 | -0.02 | -0.02 | -0.05 | -0.05 |
| **p-val ms boys** | | 0.072 | | 0.009 | | 0.000 | | 0.088 |
| p-val ha boys | | 0.428 | | 0.102 | | 0.689 | | 0.982 |
| N | 3,520 | 3,520 | 3,637 | 3,637 | 3,637 | 3,637 | 3,637 | 3,637 |
| Panel B: Less sociable students at baseline | | | | | | | | |
| More sociable | 0.269 | -0.119 | 0.063** | -0.023 | 0.106*** | 0.035 | 0.044** | 0.016 |
| | (0.195) | (0.260) | (0.032) | (0.040) | (0.039) | (0.048) | (0.022) | (0.028) |
| Higher-achieving | -0.119 | -0.229 | -0.002 | -0.028 | 0.018 | -0.027 | -0.062*** | -0.061* |
| | (0.192) | (0.254) | (0.032) | (0.041) | (0.038) | (0.046) | (0.023) | (0.031) |
| More sociable × boy | | 0.924** | | 0.209*** | | 0.172** | | 0.068 |
| | | (0.389) | | (0.064) | | (0.079) | | (0.044) |
| Higher-achieving × boy | | 0.250 | | 0.062 | | 0.108 | | -0.005 |
| | | (0.382) | | (0.064) | | (0.078) | | (0.046) |
| mean control | 11.65 | 11.65 | -0.25 | -0.25 | -0.25 | -0.25 | -0.31 | -0.31 |
| **p-val ms boys** | | 0.006 | | 0.000 | | 0.001 | | 0.013 |
| p-val ha boys | | 0.943 | | 0.501 | | 0.199 | | 0.052 |
| N | 1,747 | 1,747 | 1,828 | 1,828 | 1,828 | 1,828 | 1,828 | 1,828 |
| Panel C: More sociable students at baseline | | | | | | | | |
| More sociable | -0.267 | -0.454* | -0.026 | -0.049 | 0.036 | -0.011 | 0.021 | 0.020 |
| | (0.207) | (0.250) | (0.035) | (0.043) | (0.037) | (0.045) | (0.033) | (0.042) |
| Higher-achieving | 0.300 | 0.271 | 0.065* | 0.052 | -0.021 | 0.050 | 0.112*** | 0.145*** |
| | (0.209) | (0.263) | (0.035) | (0.045) | (0.037) | (0.044) | (0.032) | (0.041) |
| More sociable × boy | | 0.456 | | 0.058 | | 0.118 | | 0.003 |
| | | (0.434) | | (0.072) | | (0.077) | | (0.068) |
| Higher-achieving × boy | | 0.066 | | 0.034 | | -0.176** | | -0.080 |
| | | (0.434) | | (0.072) | | (0.077) | | (0.069) |
| mean control | 14.68 | 14.68 | 0.27 | 0.27 | -0.00 | -0.00 | 0.19 | 0.19 |
| **p-val ms boys** | | 0.995 | | 0.875 | | 0.091 | | 0.665 |
| p-val ha boys | | 0.326 | | 0.125 | | 0.046 | | 0.232 |
| N | 1,773 | 1,773 | 1,809 | 1,809 | 1,809 | 1,809 | 1,809 | 1,809 |

**Notes:** This table reports the effect of being assigned to more sociable and higher-achieving peers on social skills outcomes. All regressions include strata fixed effects and control for the baseline value of the dependent variable. For the 2017 cohort all regressions include strata-by-classroom fixed effects. The control group is defined as being assigned to less sociable and lower-achieving peers. Standard errors are clustered at the peer group type-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

TABLE 5: Reduced-Form Estimates on Academic Performance

| Dependent variable: | Grades | | | | Test scores | | | |
|---|---|---|---|---|---|---|---|---|
| | Math | | Reading | | Math | | Reading | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| | Panel A: All Students | | | | | | | |
| More sociable | 0.003 | 0.002 | 0.021 | 0.029 | -0.032 | -0.020 | 0.020 | -0.008 |
| | (0.033) | (0.044) | (0.032) | (0.042) | (0.025) | (0.031) | (0.033) | (0.044) |
| Higher-achieving | -0.029 | -0.033 | 0.002 | 0.027 | -0.029 | -0.017 | -0.041 | -0.068* |
| | (0.025) | (0.034) | (0.024) | (0.031) | (0.021) | (0.025) | (0.027) | (0.037) |
| More sociable × boy | | 0.002 | | -0.018 | | -0.028 | | 0.067 |
| | | (0.068) | | (0.064) | | (0.050) | | (0.065) |
| Higher-achieving × boy | | 0.010 | | -0.058 | | -0.029 | | 0.065 |
| | | (0.051) | | (0.049) | | (0.043) | | (0.053) |
| mean control | -0.01 | -0.01 | -0.04 | -0.04 | -0.04 | -0.04 | -0.03 | -0.03 |
| **p-val ms boys** | | 0.936 | | 0.818 | | 0.220 | | 0.225 |
| p-val ha boys | | 0.547 | | 0.411 | | 0.181 | | 0.925 |
| N | 4,331 | 4,331 | 4,334 | 4,334 | 4,335 | 4,335 | 4,357 | 4,357 |
| | Panel B: Lower-achieving students at baseline | | | | | | | |
| More sociable | -0.006 | -0.013 | 0.038 | 0.023 | -0.046 | -0.069* | 0.017 | 0.005 |
| | (0.049) | (0.065) | (0.044) | (0.060) | (0.033) | (0.041) | (0.044) | (0.059) |
| Higher-achieving | -0.086** | -0.139*** | -0.062* | -0.043 | -0.060** | -0.068** | -0.072* | -0.129*** |
| | (0.037) | (0.049) | (0.034) | (0.045) | (0.027) | (0.032) | (0.037) | (0.050) |
| More sociable × boy | | 0.015 | | 0.035 | | 0.054 | | 0.026 |
| | | (0.098) | | (0.087) | | (0.068) | | (0.088) |
| Higher-achieving × boy | | 0.123* | | -0.044 | | 0.020 | | 0.134* |
| | | (0.074) | | (0.070) | | (0.057) | | (0.074) |
| mean control | -0.20 | -0.20 | -0.16 | -0.16 | -0.29 | -0.29 | -0.09 | -0.09 |
| **p-val ms boys** | | 0.980 | | 0.360 | | 0.781 | | 0.637 |
| p-val ha boys | | 0.772 | | 0.104 | | 0.302 | | 0.937 |
| N | 2,159 | 2,159 | 2,160 | 2,160 | 2,159 | 2,159 | 2,172 | 2,172 |
| | Panel C: Higher-achieving students at baseline | | | | | | | |
| More sociable | 0.012 | 0.019 | 0.001 | 0.031 | -0.016 | 0.035 | 0.020 | -0.028 |
| | (0.045) | (0.056) | (0.045) | (0.059) | (0.036) | (0.045) | (0.048) | (0.066) |
| Higher-achieving | 0.026 | 0.065 | 0.064* | 0.092** | -0.002 | 0.030 | -0.012 | -0.013 |
| | (0.034) | (0.043) | (0.033) | (0.042) | (0.030) | (0.037) | (0.038) | (0.053) |
| More sociable × boy | | -0.015 | | -0.070 | | -0.117 | | 0.114 |
| | | (0.092) | | (0.092) | | (0.073) | | (0.096) |
| Higher-achieving × boy | | -0.094 | | -0.067 | | -0.074 | | 0.001 |
| | | (0.070) | | (0.069) | | (0.062) | | (0.074) |
| mean control | 0.26 | 0.26 | 0.14 | 0.14 | 0.32 | 0.32 | 0.05 | 0.05 |
| **p-val ms boys** | | 0.962 | | 0.579 | | 0.150 | | 0.222 |
| p-val ha boys | | 0.604 | | 0.640 | | 0.371 | | 0.817 |
| N | 2,172 | 2,172 | 2,174 | 2,174 | 2,176 | 2,176 | 2,185 | 2,185 |

**Notes:** This table reports the effect of being assigned to more sociable and higher-achieving peers identified at baseline on grades and test scores. All regressions include strata fixed effects and control for the baseline value of the dependent variable. For the 2017 cohort all regressions include strata-by-classroom fixed effects. The control group is defined as being assigned to less sociable and lower-achieving peers. Grades are standardized at the school-by-grade level and test scores at the grade level. Standard errors are clustered at the peer group type-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

TABLE 6: 2SLS Estimates on Social Skills

| Group: | All students | | | Less sociable | | | More sociable | | |
|---|---|---|---|---|---|---|---|---|---|
| | All | Boys | Girls | All | Boys | Girls | All | Boys | Girls |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Neighbors' sociability | 0.142*** | 0.340*** | 0.035 | 0.226*** | 0.464*** | 0.093 | 0.066 | 0.289** | -0.029 |
| | (0.049) | (0.095) | (0.055) | (0.076) | (0.132) | (0.091) | (0.064) | (0.140) | (0.065) |
| Neighbors' achievement | -0.005 | -0.093 | 0.025 | -0.003 | 0.049 | -0.063 | -0.020 | -0.276** | 0.101 |
| | (0.044) | (0.083) | (0.050) | (0.063) | (0.108) | (0.075) | (0.062) | (0.127) | (0.068) |
| F sociability | 830.12 | 227.68 | 692.77 | 365.34 | 93.54 | 323.10 | 470.32 | 134.75 | 400.77 |
| F achievement | 912.02 | 351.47 | 568.71 | 436.44 | 218.31 | 236.93 | 497.58 | 154.05 | 353.15 |
| N | 3,555 | 1,477 | 2,078 | 1,788 | 749 | 1,039 | 1,767 | 728 | 1,039 |

**Notes:** This table reports 2SLS estimates of average sociability and academic achievement of neighbors on students' social outcomes, using treatment assignment as instruments. All regressions include strata fixed effects and control for the dependent variable at baseline. For the 2017 cohort, all regressions include strata-by-classroom fixed effects. Standard errors are clustered at the group of peers-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

TABLE 7: 2SLS Estimates on Academic Achievement

| Group: | All students | | | Lower-achieving | | | Higher-achieving | | |
|---|---|---|---|---|---|---|---|---|---|
| | All | Boys | Girls | All | Boys | Girls | All | Boys | Girls |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Panel A: Dependent variable math scores | | | | | | | | | |
| Neighbors' sociability | -0.048 | -0.061 | -0.029 | -0.056 | -0.001 | -0.089 | -0.025 | -0.120 | 0.058 |
| | (0.045) | (0.078) | (0.052) | (0.056) | (0.101) | (0.065) | (0.069) | (0.116) | (0.081) |
| Neighbors' achievement | -0.044 | -0.067 | -0.024 | -0.102** | -0.088 | -0.115** | 0.001 | -0.039 | 0.053 |
| | (0.035) | (0.061) | (0.042) | (0.049) | (0.093) | (0.054) | (0.049) | (0.081) | (0.061) |
| F sociability | 215.25 | 68.93 | 159.91 | 147.16 | 57.24 | 92.30 | 83.57 | 24.12 | 73.61 |
| F achievement | 409.13 | 187.18 | 228.64 | 170.44 | 80.26 | 97.61 | 243.51 | 114.60 | 137.78 |
| N | 4,335 | 1,937 | 2,398 | 2,159 | 971 | 1,188 | 2,176 | 966 | 1,210 |
| Panel B: Dependent variable reading scores | | | | | | | | | |
| Neighbors' sociability | 0.048 | 0.111 | 0.001 | 0.051 | 0.049 | 0.046 | 0.043 | 0.154 | -0.047 |
| | (0.060) | (0.095) | (0.076) | (0.074) | (0.121) | (0.093) | (0.094) | (0.145) | (0.121) |
| Neighbors' achievement | -0.069 | -0.021 | -0.111* | -0.124* | 0.012 | -0.213*** | -0.022 | -0.052 | -0.020 |
| | (0.046) | (0.069) | (0.061) | (0.065) | (0.106) | (0.082) | (0.063) | (0.091) | (0.089) |
| F sociability | 218.36 | 70.52 | 160.74 | 150.52 | 59.32 | 93.63 | 83.61 | 23.86 | 74.00 |
| F achievement | 410.92 | 187.85 | 229.68 | 172.51 | 81.62 | 98.23 | 242.67 | 113.38 | 138.45 |
| N | 4,357 | 1,946 | 2,411 | 2,172 | 977 | 1,195 | 2,185 | 969 | 1,216 |

**Notes:** This table reports 2SLS estimates of average sociability and academic achievement of neighbors on students' academic outcomes, using treatment assignment as instruments. All regressions include strata fixed effects and control for the dependent variable at baseline. For the 2017 cohort, all regressions include strata-by-classroom fixed effects. Standard errors are clustered at the group of peers-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

TABLE 8: Mechanisms on Social Peer Effects

| Dependent variable: | I am social | | Popularity ranking | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Panel A: Less sociable students at baseline | | | | |
| More sociable | 0.002 | -0.091** | -0.513 | -2.752* |
| | (0.036) | (0.042) | (1.065) | (1.404) |
| Higher-achieving | -0.009 | 0.055 | -0.139 | -0.843 |
| | (0.035) | (0.041) | (1.071) | (1.449) |
| More sociable × boy | | 0.228*** | | 5.344** |
| | | (0.074) | | (2.117) |
| Higher-achieving × boy | | -0.158** | | 1.599 |
| | | (0.072) | | (2.122) |
| mean control | 1.43 | 1.43 | 58.77 | 58.77 |
| **p-val ms boys** | | 0.026 | | 0.104 |
| p-val ha boys | | 0.082 | | 0.626 |
| N | 1,832 | 1,832 | 1,666 | 1,666 |
| Panel B: More sociable students at baseline | | | | |
| More sociable | -0.032 | -0.001 | 0.851 | 0.845 |
| | (0.035) | (0.044) | (0.960) | (1.253) |
| Higher-achieving | 0.042 | 0.033 | -0.941 | -0.784 |
| | (0.036) | (0.045) | (0.935) | (1.224) |
| More sociable × boy | | -0.078 | | 0.016 |
| | | (0.072) | | (1.953) |
| Higher-achieving × boy | | 0.022 | | -0.375 |
| | | (0.074) | | (1.889) |
| mean control | 1.50 | 1.50 | 65.26 | 65.26 |
| **p-val ms boys** | | 0.169 | | 0.565 |
| p-val ha boys | | 0.347 | | 0.422 |
| N | 1,822 | 1,822 | 1,703 | 1,703 |

**Notes:** This table reports the effect of being assigned to more sociable and higher-achieving peers identified at baseline on self-confidence in social skills. All regressions include strata fixed effects and control for the dependent variable at baseline. For the 2017 cohort, all regressions include strata-by-classroom fixed effects. The control group is defined as being assigned to less sociable and lower-achieving peers. Standard errors are clustered at the group of peers-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

TABLE 9: Mechanisms on Academic Peer Effects

| Dependent variable: | I am skilled academically | | Academic ranking | | I want to do better than my peers | | I avoid doing worse than my peers | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Panel A: Lower-achieving students at baseline | | | | | | | | |
| More sociable | -0.028** | -0.011 | -0.713 | -0.494 | -0.012 | -0.046 | 0.102 | 0.071 |
| | (0.013) | (0.016) | (0.806) | (1.076) | (0.150) | (0.197) | (0.307) | (0.398) |
| Higher-achieving | -0.007 | 0.020 | -0.156 | -0.287 | -0.218* | -0.514*** | -0.236 | -0.711** |
| | (0.013) | (0.016) | (0.701) | (0.952) | (0.132) | (0.175) | (0.275) | (0.358) |
| More sociable × boy | | -0.037 | | -0.527 | | 0.071 | | 0.057 |
| | | (0.027) | | (1.622) | | (0.297) | | (0.621) |
| Higher-achieving × boy | | -0.064** | | 0.319 | | 0.710*** | | 1.138** |
| | | (0.026) | | (1.404) | | (0.265) | | (0.560) |
| mean control | 0.15 | 0.15 | 65.64 | 65.64 | 10.16 | 10.16 | 19.54 | 19.54 |
| **p-val ms boys** | | 0.030 | | 0.401 | | 0.911 | | 0.788 |
| p-val ha boys | | 0.036 | | 0.976 | | 0.328 | | 0.322 |
| N | 2,763 | 2,763 | 2,746 | 2,746 | 2,609 | 2,609 | 2,609 | 2,609 |
| Panel B: Higher-achieving students at baseline | | | | | | | | |
| More sociable | -0.013 | -0.000 | -0.315 | -0.704 | -0.235 | -0.184 | -0.298 | 0.026 |
| | (0.016) | (0.019) | (0.729) | (0.884) | (0.146) | (0.192) | (0.285) | (0.355) |
| Higher-achieving | 0.018 | 0.033* | 0.024 | -0.762 | -0.003 | -0.019 | 0.007 | -0.176 |
| | (0.015) | (0.017) | (0.632) | (0.790) | (0.122) | (0.159) | (0.245) | (0.309) |
| More sociable × boy | | -0.031 | | 0.940 | | -0.128 | | -0.803 |
| | | (0.035) | | (1.512) | | (0.293) | | (0.592) |
| Higher-achieving × boy | | -0.037 | | 1.890 | | 0.039 | | 0.450 |
| | | (0.031) | | (1.303) | | (0.249) | | (0.505) |
| mean control | 0.19 | 0.19 | 69.40 | 69.40 | 10.07 | 10.07 | 20.18 | 20.18 |
| **p-val ms boys** | | 0.291 | | 0.849 | | 0.164 | | 0.102 |
| p-val ha boys | | 0.863 | | 0.277 | | 0.918 | | 0.493 |
| N | 2,798 | 2,798 | 2,786 | 2,786 | 2,695 | 2,695 | 2,695 | 2,695 |

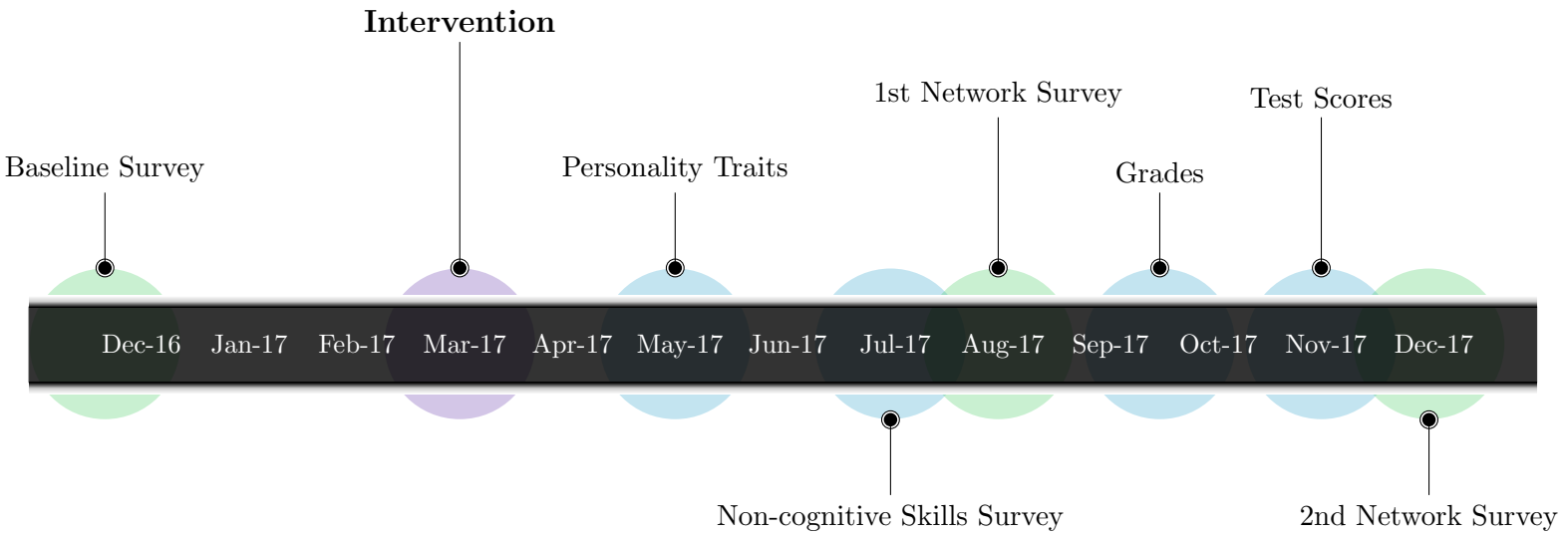
**Notes:** This table reports the effect of being assigned to more sociable and higher-achieving peers identified at baseline on self-confidence in academic skills and preferences for competition. All regressions include strata fixed effects and control for the dependent variable at baseline. For the 2017 cohort, all regressions include strata-by-classroom fixed effects. The control group is defined as being assigned to less sociable and lower-achieving peers. Standard errors are clustered at the group of peers-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

TABLE 10: Correlations and Effects on Hard Outcomes

| Dependent variable: | Dropout | | College | | Certified | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | | | Panel A: Correlations | | | |
| Social skills | -0.001 | | 0.016** | | 0.016*** | |
| | (0.001) | | (0.008) | | (0.006) | |
| Math score | -0.003 | | 0.061*** | | 0.034*** | |
| | (0.002) | | (0.010) | | (0.008) | |
| Reading score | -0.000 | | 0.014 | | 0.007 | |
| | (0.002) | | (0.010) | | (0.008) | |
| mean control | 0.02 | | 0.46 | | 0.20 | |
| N | 6,096 | | 3,649 | | 3,649 | |
| | | | Panel B: Impact on less sociable boys | | | |
| More sociable | -0.023*** | -0.016** | 0.012 | 0.010 | 0.048** | 0.039* |
| | (0.008) | (0.008) | (0.029) | (0.029) | (0.022) | (0.022) |
| Higher-achieving | 0.020** | 0.016* | 0.001 | 0.007 | -0.011 | -0.010 |
| | (0.010) | (0.009) | (0.029) | (0.029) | (0.023) | (0.023) |
| mean control | 0.02 | 0.02 | 0.46 | 0.46 | 0.20 | 0.20 |
| N | 753 | 753 | 753 | 753 | 753 | 753 |

**Notes:** This table reports correlation of social skills with hard outcomes (Panel A), and the effect of being assigned to more sociable and higher-achieving peers on hard outcomes for less sociable boys (Panel B). All regressions in Panel A include school-by-cohort-by-gender fixed effects. All regressions in Panel B include strata fixed effects and control for the dependent variable at baseline. Standard errors are clustered at the group of peers-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

FIGURE 1: Timeline of the Project




**Notes:** This figure presents the timeline of the project. The green circles represent data collection with surveys, the blue circles collection of administrative data through the Ministry of Education, and the purple circle the implementation of the intervention.

FIGURE 2: Groups of Peers in the Experimental Design

**Type of Peers**

| **Student Type** | higher-achieving more sociable | higher-achieving less sociable | lower-achieving more sociable | lower-achieving less sociable |
|---|---|---|---|---|
| higher-achieving more sociable | Group 1 | Group 2 | Group 3 | Group 4 |
| higher-achieving less sociable | Group 2 | Group 5 | Group 6 | Group 7 |
| lower-achieving more sociable | Group 3 | Group 6 | Group 8 | Group 9 |
| lower-achieving less sociable | Group 4 | Group 7 | Group 9 | Group 10 |

**Notes:** this figure shows the ten *groups of peers* in my experimental design. It represents all possible combinations between student type and type of peers. Rows are described by student types, and columns illustrate the types of peers to which they were randomly assigned. The diagonal of the matrix is composed by groups of a single type. The matrix is symmetric by virtue of the fact that students are matched with peers of the assigned type.

FIGURE 3: Figure Appendix: Dorm Structure

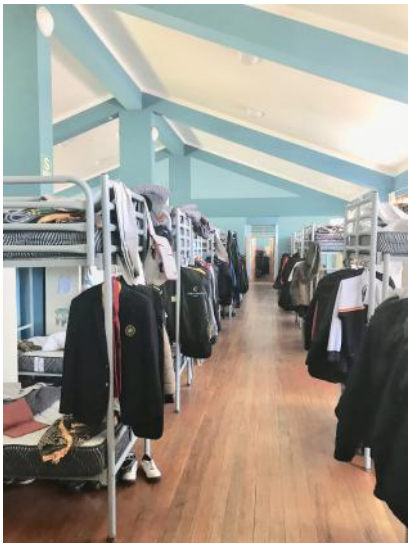
School in Lima



School in Piura

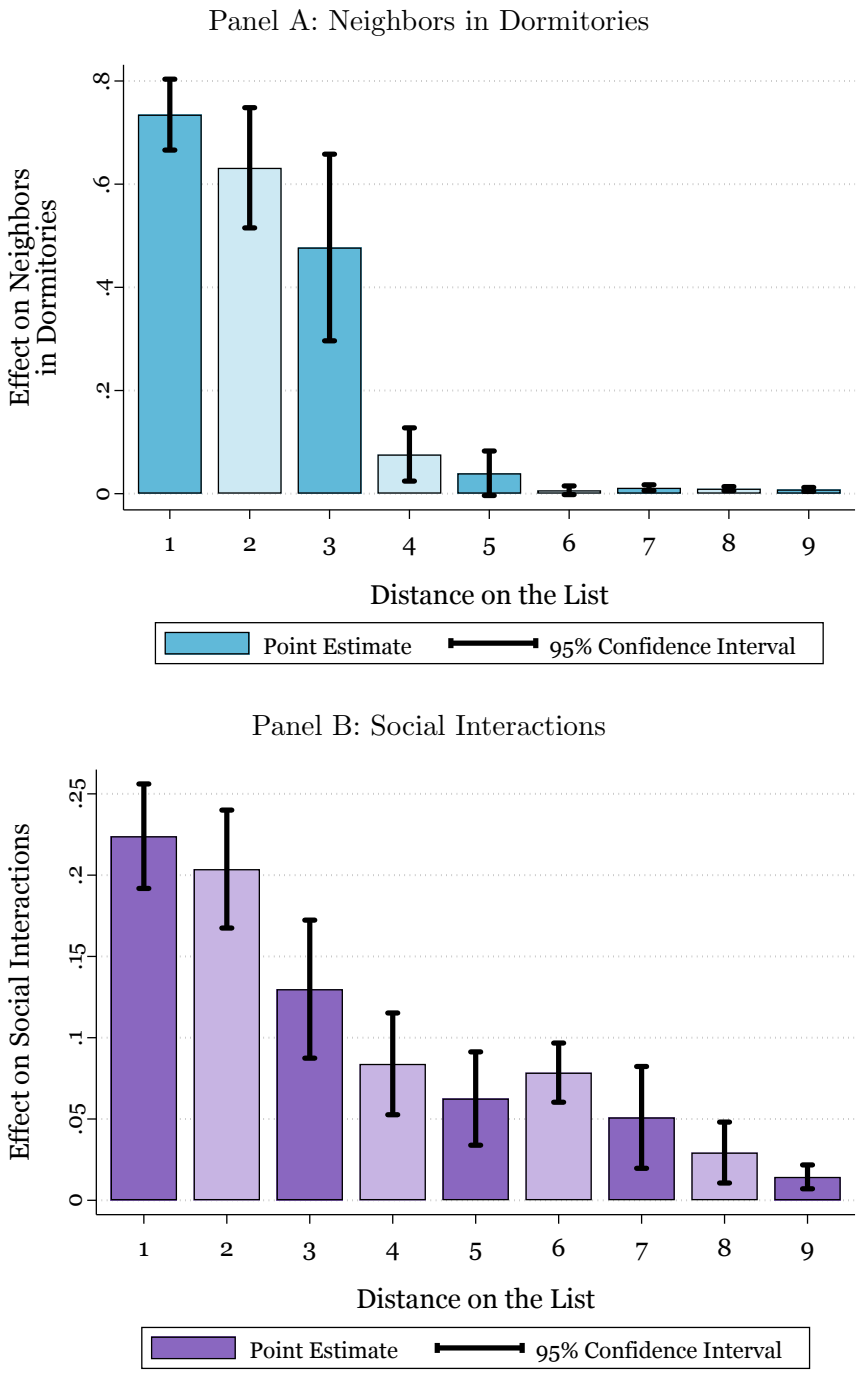


School in Cusco



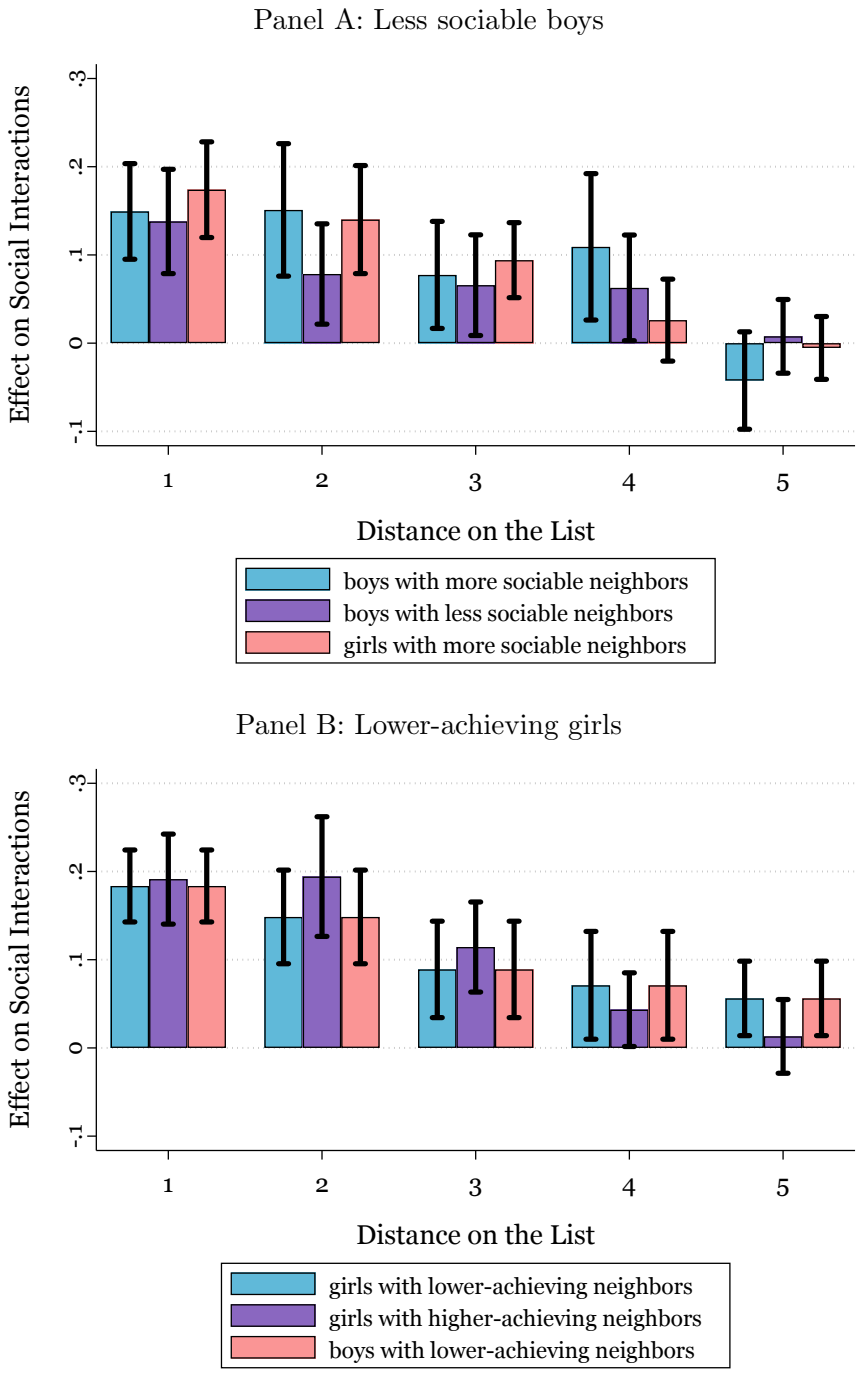
**Notes:** This figure displays pictures of the dorms for the schools in Lima, Piura, and Cusco. It illustrates the vast heterogeneity in the type of rooms across the schools.

FIGURE 4: Effects of Proximity on the List on Neighbors and Social Interactions




**Notes:** This figure shows the impact of distance between a pair of students on the likelihood of being neighbors and social interaction (friends, study, and playing games or sports). Distance is captured by nine distance dummies, and 95% confidence intervals are displayed for all proximity effects. Students are at an odd distance from their treatment peers, and at an even distance from the peers of their type, by construction of the experimental design. All estimations control for strata fixed effects. Standard errors are clustered at the school-by-cohort level.

FIGURE 5: Social Interactions of Most Affected vs. Comparable Groups




**Notes:** This figure shows the impact of distance between a pair of students on the likelihood of social interactions(friends, study, and playing games or sports). Distance is captured by nine distance dummies, and 95% confidence intervals are displayed for all proximity effects. Students are at an odd distance from their treatment peers, and at an even distance from the peers of their type, by construction of the experimental design. All estimations control for strata fixed effects. Standard errors are clustered at the school-by-cohort level.

# A Supplementary Material

TABLE A.1: Summary Statistics for the Networks Survey at Baseline

| | All Students | By Sociability | | By Academic Achievement | |
|---|---|---|---|---|---|
| | | Less Sociable | More Sociable | Lower Achieving | Higher Achieving |
| Variable | (1) | (2) | (3) | (4) | (5) |
| Dorm preferences degree | 6.49 | 5.16 | 7.83 | 6.27 | 6.71 |
| | (3.47) | (2.67) | (3.66) | (3.52) | (3.41) |
| Dorm preferences mutual degree | 1.69 | 1.35 | 2.04 | 1.57 | 1.82 |
| | (1.54) | (1.27) | (1.69) | (1.49) | (1.57) |
| Dorm preferences centrality | -0.00 | -0.23 | 0.23 | -0.03 | 0.03 |
| | (1.00) | (0.75) | (1.14) | (0.97) | (1.02) |
| Friendships degree | 7.87 | 5.67 | 10.10 | 7.62 | 8.12 |
| | (5.11) | (2.75) | (5.91) | (5.11) | (5.10) |
| Friendships mutual degree | 2.10 | 1.65 | 2.55 | 1.98 | 2.23 |
| | (1.68) | (1.37) | (1.83) | (1.70) | (1.65) |
| Friendships centrality | -0.00 | -0.51 | 0.51 | -0.06 | 0.06 |
| | (1.00) | (0.57) | (1.07) | (0.98) | (1.00) |
| Study partnerships degree | 4.76 | 3.71 | 5.82 | 4.54 | 4.98 |
| | (2.66) | (1.94) | (2.86) | (2.52) | (2.77) |
| Study partnerships mutual degree | 1.11 | 0.92 | 1.29 | 1.04 | 1.18 |
| | (1.08) | (0.95) | (1.18) | (1.05) | (1.12) |
| Study partnerships centrality | 0.00 | -0.37 | 0.37 | -0.07 | 0.07 |
| | (1.00) | (0.66) | (1.13) | (0.92) | (1.06) |
| Social partnerships degree | 5.67 | 4.44 | 6.90 | 5.61 | 5.73 |
| | (3.13) | (2.29) | (3.36) | (3.20) | (3.05) |
| Social partnerships mutual degree | 1.23 | 1.00 | 1.46 | 1.21 | 1.25 |
| | (1.23) | (1.05) | (1.36) | (1.24) | (1.23) |
| Social partnerships centrality | 0.00 | -0.37 | 0.37 | -0.01 | 0.01 |
| | (1.00) | (0.69) | (1.11) | (1.01) | (0.98) |
| Any partnership degree | 11.07 | 8.23 | 13.92 | 10.78 | 11.35 |
| | (5.66) | (3.19) | (6.15) | (5.61) | (5.70) |
| Any partnership mutual degree | 3.34 | 2.60 | 4.07 | 3.20 | 3.48 |
| | (2.18) | (1.66) | (2.38) | (2.19) | (2.16) |
| Any partnership centrality | 0.00 | -0.71 | 0.71 | -0.05 | 0.05 |
| | (1.00) | (0.44) | (0.89) | (0.97) | (1.01) |
| Peers who named the student as a leader | 2.63 | 1.54 | 3.73 | 1.91 | 3.35 |
| | (5.16) | (3.31) | (6.32) | (4.21) | (5.86) |
| Peers who named the student as friendly | 2.71 | 1.91 | 3.50 | 2.61 | 2.80 |
| | (2.81) | (1.91) | (3.31) | (2.76) | (2.86) |
| Peers who named the student as popular | 2.43 | 1.51 | 3.35 | 1.99 | 2.86 |
| | (5.32) | (3.44) | (6.58) | (4.48) | (6.02) |
| Peers who named the student as skilled | 2.62 | 1.80 | 3.45 | 1.20 | 4.04 |
| | (6.45) | (5.97) | (6.80) | (3.14) | (8.32) |
| Peers who named the student as shy | 2.00 | 2.52 | 1.49 | 2.18 | 1.83 |
| | (4.67) | (5.16) | (4.04) | (4.62) | (4.71) |
| N | 3,654 | 1,832 | 1,822 | 1,822 | 1,832 |

**Notes:** This table reports summary statistics for the social networks survey at baseline. Information is presented by categories of student student. Standard errors are reported in parentheses. Column 1 shows statistics for all the students and columns 2 to 5 according to the classification of students by social skills and academic achievement. The dorm preferences network is based on the question: "who would you like to have as roommates?". The friendship network is based on the question: "who are your friends?". The study partnerships network is based on the question: "with whom have you studied?". The social partnerships network is based on the question: "with whom have you engage in social activities with such as playing or dancing?". The any partnership network aggregates the four questions.

## Table A.2: Correlation of Sociability and Social Skills Outcomes

| | Big Five Personality Traits | | | | | Peers' Perception | | | | Other measures of social skills | Social Skills Index Before the Intervention | Social Skills Index After the Interventipn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Openness | Conscientiousness | Emotional Stability | Extraversion | Agreeableness | Leadership | Friendliness | Popularity | Shyness | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Academic achievement at baseline | 0.090*** | -0.001 | 0.064*** | -0.014 | -0.013 | 0.217*** | 0.042** | 0.105*** | -0.066*** | 0.047*** | 0.064*** | 0.042** |
| | (0.021) | (0.022) | (0.022) | (0.019) | (0.020) | (0.020) | (0.016) | (0.022) | (0.019) | (0.016) | (0.017) | (0.016) |
| Sociability at baseline | 0.103*** | 0.061** | 0.032* | 0.142*** | 0.120*** | 0.230*** | 0.359*** | 0.215*** | -0.103*** | 0.099*** | 0.139*** | 0.142*** |
| | (0.024) | (0.025) | (0.017) | (0.021) | (0.017) | (0.021) | (0.020) | (0.029) | (0.021) | (0.018) | (0.018) | (0.018) |
| Social-fit score | 0.072*** | 0.022 | 0.001 | 0.063*** | 0.027 | 0.137*** | 0.073*** | 0.104*** | -0.113*** | 0.027 | 0.066*** | 0.046** |
| | (0.018) | (0.020) | (0.020) | (0.019) | (0.020) | (0.015) | (0.016) | (0.017) | (0.020) | (0.018) | (0.017) | (0.019) |
| Interview score | 0.092*** | 0.073*** | 0.071*** | 0.091*** | 0.049*** | 0.068*** | 0.057*** | 0.049*** | -0.036** | 0.074*** | 0.118*** | 0.088*** |
| | (0.019) | (0.016) | (0.016) | (0.018) | (0.018) | (0.015) | (0.015) | (0.017) | (0.017) | (0.015) | (0.016) | (0.015) |
| N | 3,106 | 3,106 | 3,106 | 3,106 | 3,106 | 3,637 | 3,637 | 3,637 | 3,637 | 3,654 | 3,654 | 3,654 |

**Notes:** This table reports standardized estimates of an OLS regression on social skills outcomes of sociability at baseline and the score in the three tests of the admission process to the COAR Network. All regressions include school-by-grade-by-gender fixed effects. Sociability at baseline is measured by the eigenvector centrality of an aggregate social network of dorm preferences, friendships, study, and social partnerships. Eigenvector centrality is a measure of the influence of a student in the network. Academic achievement at baseline is the score in the admission test to the COAR Network, which evaluates the applicants in math and reading comprehension. Personality traits correspond to the Big Five. Measures of peers' perception correspond to the number of peers who think the student is in the top 5 of leadership, friendliness, popularity, and shyness (school-by-grade). The table presents two social skills indexes for robustness. The first one is constructed using Principal Component Analysis (PCA) on all the variables that measure social skills (see Appendix C for details), excluding personality traits and measures of peers' perception. The second index is contructed using Principal Component Analysis (PCA) on all the variables that measure social skills (see Appendix C for details).

TABLE A.3: Balance Tests for the More Sociable Peers Treatment

| Variable | All Students | | Less Sociable at Baseline | | More Sociable at Baseline | |
|---|---|---|---|---|---|---|
| | Control mean | Difference | Control mean | Difference | Control mean | Difference |
| Admission test | -0.016 | 0.002 | -0.064 | -0.024 | 0.058 | 0.028 |
| | | (0.019) | | (0.027) | | (0.026) |
| Interview score | 14.065 | 0.009 | 14.053 | 0.019 | 14.082 | -0.000 |
| | | (0.042) | | (0.059) | | (0.061) |
| Social-fit score | 20.001 | 0.095 | 19.977 | 0.071 | 20.035 | 0.119 |
| | | (0.064) | | (0.088) | | (0.092) |
| Female | 0.589 | 0.003 | 0.594 | 0.002 | 0.582 | 0.004 |
| | | (0.003) | | (0.004) | | (0.003) |
| Not poor | 0.426 | -0.014 | 0.393 | -0.008 | 0.475 | -0.020 |
| | | (0.014) | | (0.021) | | (0.020) |
| Poor | 0.364 | 0.026* | 0.378 | 0.034 | 0.344 | 0.019 |
| | | (0.015) | | (0.022) | | (0.020) |
| Extremely poor | 0.210 | -0.012 | 0.229 | -0.026 | 0.182 | 0.001 |
| | | (0.012) | | (0.018) | | (0.017) |
| Rural | 0.279 | -0.014 | 0.315 | -0.028 | 0.224 | 0.000 |
| | | (0.012) | | (0.018) | | (0.017) |
| Subsidized health insurance | 0.508 | 0.008 | 0.552 | -0.011 | 0.443 | 0.027 |
| | | (0.016) | | (0.022) | | (0.022) |
| Average math at baseline | -0.049 | 0.019 | -0.157 | 0.012 | 0.115 | 0.027 |
| | | (0.027) | | (0.037) | | (0.038) |
| Average reading at baseline | -0.049 | 0.010 | -0.169 | 0.041 | 0.134 | -0.021 |
| | | (0.028) | | (0.041) | | (0.038) |
| Sociability index baseline | -0.042 | -0.041 | -0.293 | -0.033 | 0.333 | -0.050 |
| | | (0.080) | | (0.117) | | (0.111) |
| Indegree baseline network | -0.077 | -0.021 | -0.434 | -0.003 | 0.460 | -0.040 |
| | | (0.027) | | (0.033) | | (0.044) |
| Outdegree baseline network | -0.094 | 0.023 | -0.419 | 0.016 | 0.395 | 0.029 |
| | | (0.026) | | (0.027) | | (0.046) |
| Centrality baseline network | 0.303 | 0.003 | 0.203 | -0.002 | 0.453 | 0.008 |
| | | (0.003) | | (0.003) | | (0.006) |
| Peers' perception leader | 2.502 | -0.184 | 1.587 | -0.113 | 3.879 | -0.257 |
| | | (0.151) | | (0.132) | | (0.272) |
| Peers' perception friendly | 2.553 | -0.009 | 1.837 | 0.200** | 3.631 | -0.221 |
| | | (0.080) | | (0.083) | | (0.136) |
| Peers' perception popular | 2.203 | 0.110 | 1.466 | 0.126 | 3.313 | 0.093 |
| | | (0.159) | | (0.142) | | (0.285) |
| Peers' perception shy | 2.083 | 0.029 | 2.560 | -0.131 | 1.366 | 0.192 |
| | | (0.144) | | (0.227) | | (0.178) |
| Baseline grit | 43.707 | -0.248 | 43.340 | -0.171 | 44.251 | -0.325 |
| | | (0.198) | | (0.285) | | (0.274) |
| Baseline Rosenberg scale | 32.991 | 0.101 | 32.777 | 0.119 | 33.306 | 0.081 |
| | | (0.154) | | (0.224) | | (0.212) |
| Baseline Read the Mind | 20.521 | -0.060 | 20.224 | 0.184 | 20.960 | -0.304* |
| | | (0.130) | | (0.186) | | (0.180) |
| Multivariate F p-value | | 0.785 | | 0.571 | | 0.726 |

**Notes:** This table reports balance checks of being assigned to more sociable peers on baseline characteristics. All regressions include strata fixed effects, control for the baseline value of the dependent variable, and include the higher-achieving peers treatment. For the 2017 cohort, all regressions include strata-by-classroom fixed effects. The control group is defined as being assigned to less sociable and lower-achieving peers. The "F p-value" correspond to the F-statistic of the more sociable peers treatment of multivariate regressions that include all the variables at baseline. Standard errors are clustered at the peer group type-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

TABLE A.4: Balance Tests for the Higher-Achieving Peers Treatment

| Variable | All Students | | Lower Achieving at Baseline | | Higher Achieving at Baseline | |
|---|---|---|---|---|---|---|
| | Control mean | Difference | Control mean | Difference | Control mean | Difference |
| Admission test | -0.163 | 0.013 | -0.787 | -0.006 | 0.764 | 0.031 |
| | | (0.016) | | (0.018) | | (0.026) |
| Interview score | 8.400 | -0.013 | 8.589 | -0.011 | 8.117 | -0.015 |
| | | (0.033) | | (0.042) | | (0.052) |
| Social-fit score | 11.973 | -0.061 | 12.161 | 0.012 | 11.693 | -0.131* |
| | | (0.049) | | (0.061) | | (0.077) |
| Female | 0.575 | -0.000 | 0.575 | 0.004 | 0.575 | -0.004 |
| | | (0.002) | | (0.004) | | (0.003) |
| Not poor | 0.443 | 0.010 | 0.404 | 0.001 | 0.502 | 0.019 |
| | | (0.012) | | (0.017) | | (0.018) |
| Poor | 0.369 | -0.017 | 0.387 | -0.005 | 0.342 | -0.030* |
| | | (0.013) | | (0.018) | | (0.017) |
| Extremely poor | 0.188 | 0.007 | 0.209 | 0.003 | 0.156 | 0.011 |
| | | (0.011) | | (0.016) | | (0.014) |
| Rural | 0.276 | -0.003 | 0.319 | -0.021 | 0.212 | 0.014 |
| | | (0.013) | | (0.019) | | (0.016) |
| Subsidized health insurance | 0.504 | 0.013 | 0.517 | 0.045** | 0.485 | -0.019 |
| | | (0.015) | | (0.021) | | (0.022) |
| Average math at baseline | -0.093 | 0.016 | -0.373 | -0.023 | 0.319 | 0.053 |
| | | (0.023) | | (0.030) | | (0.034) |
| Average reading at baseline | -0.064 | -0.000 | -0.281 | -0.012 | 0.256 | 0.011 |
| | | (0.023) | | (0.032) | | (0.033) |
| Sociability index baseline | -0.023 | 0.048 | -0.065 | 0.060 | 0.040 | 0.038 |
| | | (0.059) | | (0.083) | | (0.083) |
| Indegree baseline network | 0.008 | -0.050* | -0.075 | -0.032 | 0.131 | -0.068* |
| | | (0.027) | | (0.038) | | (0.039) |
| Outdegree baseline network | -0.001 | -0.013 | -0.016 | -0.059 | 0.021 | 0.033 |
| | | (0.028) | | (0.040) | | (0.038) |
| Centrality baseline network | 0.330 | -0.003 | 0.324 | -0.007 | 0.338 | 0.000 |
| | | (0.003) | | (0.004) | | (0.004) |
| Peers' perception leader | 2.493 | 0.006 | 1.930 | -0.036 | 3.331 | 0.050 |
| | | (0.148) | | (0.178) | | (0.236) |
| Peers' perception friendly | 2.691 | 0.010 | 2.618 | -0.001 | 2.801 | 0.021 |
| | | (0.078) | | (0.112) | | (0.109) |
| Peers' perception popular | 2.362 | -0.013 | 2.007 | -0.024 | 2.890 | -0.006 |
| | | (0.158) | | (0.186) | | (0.255) |
| Peers' perception shy | 2.020 | 0.036 | 2.110 | 0.160 | 1.886 | -0.089 |
| | | (0.146) | | (0.211) | | (0.203) |
| Baseline grit | 43.568 | 0.158 | 43.330 | 0.431 | 43.921 | -0.108 |
| | | (0.196) | | (0.271) | | (0.282) |
| Baseline Rosenberg scale | 33.013 | 0.139 | 32.854 | 0.127 | 33.249 | 0.153 |
| | | (0.154) | | (0.221) | | (0.215) |
| Baseline Read the Mind | 20.602 | -0.265** | 20.248 | -0.231 | 21.127 | -0.295 |
| | | (0.128) | | (0.180) | | (0.183) |
| Multivariate F p-value | | 0.810 | | 0.857 | | 0.625 |

**Notes:** This table reports balance checks of being assigned to higher-achieving peers on baseline characteristics. All regressions include strata fixed effects, control for the baseline value of the dependent variable, and include the more sociable peers treatment. For the 2017 cohort all regressions include strata-by-classroom fixed effects. The control group is defined as being assigned to less sociable and lower-achieving peers. The "F p-value" correspond to the F-statistic of the higher-achieving peers treatment of multivariate regressions that include all the variables at baseline. Standard errors are clustered at the peer group type-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

TABLE A.5: Reduced-Form Estimates on Social Skills with First-years Treatment

| Dependent variable: | Connections | | Centrality | | Psychological tests | | Peers' perception | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| | | | | Panel A: All students | | | | |
| More sociable | 0.001 | -0.289 | 0.023 | -0.030 | 0.073*** | 0.016 | 0.033 | 0.019 |
| | (0.148) | (0.188) | (0.024) | (0.031) | (0.028) | (0.034) | (0.021) | (0.027) |
| Higher-achieving | 0.142 | -0.085 | 0.030 | -0.003 | -0.006 | -0.001 | 0.027 | 0.047* |
| | (0.140) | (0.184) | (0.021) | (0.028) | (0.024) | (0.030) | (0.019) | (0.026) |
| More sociable × boy | | 0.695** | | 0.130*** | | 0.141** | | 0.035 |
| | | (0.302) | | (0.050) | | (0.058) | | (0.042) |
| Higher-achieving × boy | | 0.537* | | 0.080* | | -0.012 | | -0.047 |
| | | (0.283) | | (0.043) | | (0.049) | | (0.039) |
| More sociable (first-years) | -0.430 | -0.434 | -0.034 | -0.025 | 0.047 | -0.061 | 0.054 | 0.026 |
| | (0.412) | (0.532) | (0.049) | (0.060) | (0.058) | (0.073) | (0.059) | (0.081) |
| More sociable (first-years) × boy | | 0.014 | | -0.020 | | 0.246** | | 0.063 |
| | | (0.836) | | (0.100) | | (0.117) | | (0.118) |
| mean control | 14.57 | 14.57 | -0.05 | -0.05 | -0.02 | -0.02 | -0.05 | -0.05 |
| **p-val ms boys** | | 0.086 | | 0.012 | | 0.001 | | 0.100 |
| p-val ha boys | | 0.035 | | 0.021 | | 0.743 | | 0.987 |
| p-val ms boys (first-years) | | 0.514 | | 0.580 | | 0.042 | | 0.298 |
| N | 5,732 | 5,732 | 6,002 | 6,002 | 6,002 | 6,002 | 6,002 | 6,002 |

**Notes:** This table reports the effect of being assigned to more sociable and higher-achieving peers on social skills outcomes. All regressions include strata fixed effects and control for the baseline value of the dependent variable. For the 2017 cohort all regressions include strata-by-classroom fixed effects. The control group is defined as being assigned to less sociable and lower-achieving peers. Standard errors are clustered at the peer group type-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

TABLE A.6: Reduced-Form Estimates on Academic Performance with First-years Treatment

| Dependent variable: | Grades | | | | Test scores | | | |
|---|---|---|---|---|---|---|---|---|
| | Math | | Reading | | Math | | Reading | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| | Panel A: All Students | | | | | | | |
| More sociable | 0.003 | 0.002 | 0.021 | 0.029 | -0.032 | -0.020 | 0.020 | -0.008 |
| | (0.033) | (0.044) | (0.032) | (0.042) | (0.025) | (0.031) | (0.033) | (0.044) |
| Higher-achieving | -0.029 | -0.034 | 0.002 | 0.024 | -0.030 | -0.017 | -0.040 | -0.067* |
| | (0.025) | (0.034) | (0.024) | (0.031) | (0.021) | (0.026) | (0.027) | (0.037) |
| More sociable × boy | | 0.002 | | -0.018 | | -0.028 | | 0.067 |
| | | (0.068) | | (0.064) | | (0.050) | | (0.065) |
| Higher-achieving × boy | | 0.012 | | -0.051 | | -0.029 | | 0.061 |
| | | (0.051) | | (0.049) | | (0.043) | | (0.053) |
| More sociable (first-years) | 0.010 | -0.012 | 0.003 | -0.094 | -0.022 | -0.025 | 0.011 | 0.075 |
| | (0.056) | (0.073) | (0.044) | (0.059) | (0.045) | (0.058) | (0.052) | (0.070) |
| More sociable (first-years) × boy | | 0.050 | | 0.219** | | 0.006 | | -0.145 |
| | | (0.112) | | (0.087) | | (0.091) | | (0.103) |
| mean control | -0.01 | -0.01 | -0.04 | -0.04 | -0.04 | -0.04 | -0.03 | -0.03 |
| **p-val ms boys** | | 0.937 | | 0.819 | | 0.221 | | 0.225 |
| p-val ha boys | | 0.570 | | 0.475 | | 0.177 | | 0.878 |
| p-val ms boys (first-years) | | 0.654 | | 0.051 | | 0.794 | | 0.359 |
| N | 4,331 | 4,331 | 4,334 | 4,334 | 4,335 | 4,335 | 4,357 | 4,357 |
| | Panel B: Lower-achieving students at baseline | | | | | | | |
| More sociable | -0.006 | -0.013 | 0.038 | 0.023 | -0.046 | -0.069* | 0.017 | 0.005 |
| | (0.049) | (0.065) | (0.044) | (0.060) | (0.033) | (0.041) | (0.044) | (0.059) |
| Higher-achieving | -0.090** | -0.142*** | -0.062* | -0.051 | -0.062** | -0.071** | -0.073* | -0.122** |
| | (0.037) | (0.050) | (0.035) | (0.046) | (0.028) | (0.033) | (0.037) | (0.050) |
| More sociable × boy | | 0.015 | | 0.036 | | 0.054 | | 0.026 |
| | | (0.098) | | (0.088) | | (0.068) | | (0.088) |
| Higher-achieving × boy | | 0.122 | | -0.027 | | 0.020 | | 0.116 |
| | | (0.075) | | (0.071) | | (0.058) | | (0.074) |
| More sociable (first-years) | -0.041 | -0.030 | 0.008 | -0.100 | -0.033 | -0.033 | -0.009 | 0.110 |
| | (0.072) | (0.087) | (0.062) | (0.081) | (0.061) | (0.076) | (0.078) | (0.109) |
| More sociable (first-years) × boy | | -0.026 | | 0.236* | | 0.000 | | -0.258* |
| | | (0.147) | | (0.125) | | (0.124) | | (0.155) |
| mean control | -0.20 | -0.20 | -0.16 | -0.16 | -0.29 | -0.29 | -0.09 | -0.09 |
| **p-val ms boys** | | 0.979 | | 0.360 | | 0.782 | | 0.637 |
| p-val ha boys | | 0.721 | | 0.151 | | 0.284 | | 0.911 |
| p-val ms boys (first-years) | | 0.644 | | 0.152 | | 0.740 | | 0.177 |
| N | 2,158 | 2,158 | 2,159 | 2,159 | 2,158 | 2,158 | 2,171 | 2,171 |

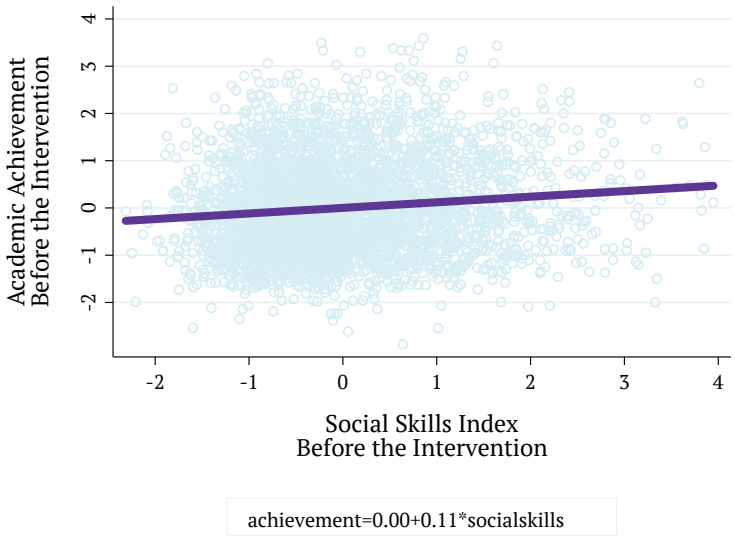
**Notes:** This table reports the effect of being assigned to more sociable and higher-achieving peers identified at baseline on grades and test scores. All regressions include strata fixed effects and control for the baseline value of the dependent variable. For the 2017 cohort all regressions include strata-by-classroom fixed effects. The control group is defined as being assigned to less sociable and lower-achieving peers. Grades are standardized at the school-by-grade level and test scores at the grade level. Standard errors are clustered at the peer group type-by-type level; *** p-value<0.01, ** p-value<0.05, * p-value<0.1.

TABLE A.7: Treatments and Outcomes Available by Cohort

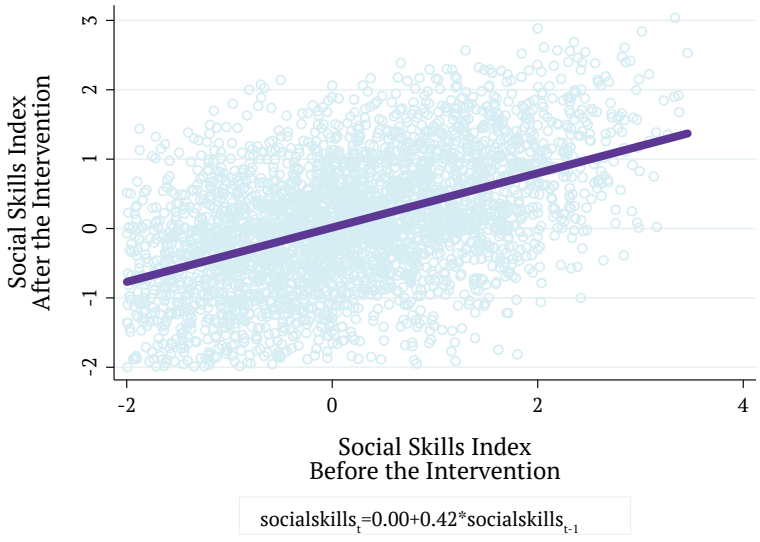
| **Treatments** | **Outcomes** | |
|---|---|---|
| | Social Skills | Academic Outcomes |
| More sociable peers | 2015, 2016 | 2016 |
| Higher-achieving peers | 2015, 2016, 2017 | 2016, 2017 |

FIGURE A.1: Correlation of Social Skills with Academic Achievement and Over Time

Panel A: Correlation with Academic Achievement




Panel B: Correlation over Time Academic Achievement




**Notes:** Panel A shows a scatter plot of academic achievement and sociability at baseline for the 2015-16 cohorts by student type. A one standard deviation of the social skills index predicts an increase in 0.11 standard deviations of academic achievement at baseline. Panel B shows a scatter plot and the linear prediction of the sociability index before and after the intervention. A one standard deviation of the social skills index before the intervention predicts an increase of 0.42 in the social skills index after the intervention.

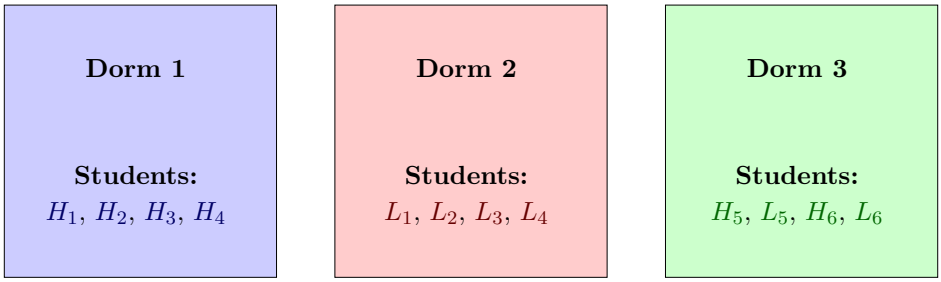
## B Use of the Lists to Allocate Students to Dorms and Classrooms

This section explains in detail how the order of students on the lists determines their allocation to dormitories. To start, recall the simple two-type example in which students were either $H$ and $L$. As described in section 3.3.2, this case allows for three groups of combined types: Group 1 (only $H$s), Group 2 (a mixed group of $H$s and $L$s), and Group 3 (only $L$s). Let us assume that the random ordering of the groups on the list is: Group 1-Group 3-Group 2. For the purpose of illustration, I will assume that there are 12 students, four in each group. After numbering the students by type, the order on the list would be the following: $H_1 - H_2 - H_3 - H_4 - L_1 - L_2 - L_3 - L_4 - H_5 - L_5 - H_6 - L_6$. Notice that on the list, the order of the students in Group 2 alternates the type of student in the form $H$-$L$.

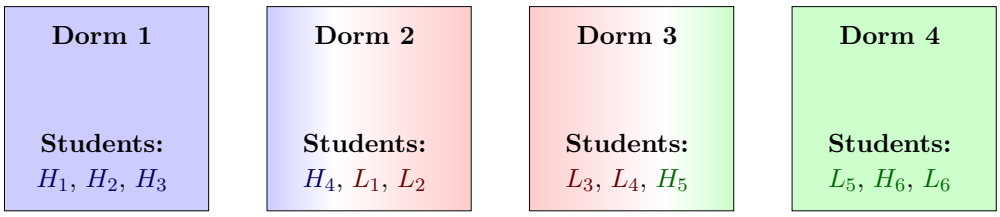
Figure B.1 shows an illustrative example of how the lists were used to allocate students to dorms and classrooms. Panel A describes the allocation when each room holds four students, Panel B when dorm rooms hold three students and Panel C for a big dorm room of 12 students. The order on the list is used to determine the allocation. When dorm rooms hold four students, dorms and *peer group types* have the same size so there is perfect compliance with the initial allocation. Yet, when dorm rooms hold three students, the first three students of type $H$ –who were assigned to Group 1 (only $H$s)—are allocated to room 1. The fourth student assigned to Group 1 is assigned to a room with two students who are type $L$. Notice that in this case there is no perfect compliance. In the big dorm, all students $H_1 - H_4$ are in beds close to each other. However, students $H_3$ and $H_4$ are also close to students of type $L$, while students $H_1$ and $H_2$ are surrounded only by peers who are type $H$.

FIGURE B.1: Illustrative Examples of the Allocation to Dorms

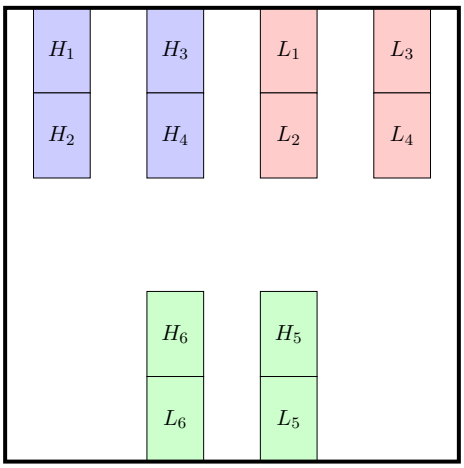
**Panel A:** Dorms of 4 Students




**Panel B:** Dorms of 3 Students




**Panel C:** Big Dorm of 6 Bunk Beds




| **Student:** | $H_1$ | $H_2$ | $H_3$ | $H_4$ | $L_1$ | $L_2$ | $L_3$ | $L_4$ | $H_5$ | $L_5$ | $H_6$ | $L_6$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **3 dorms of 4 students:** | D1 | D1 | D1 | D1 | D2 | D2 | D2 | D2 | D3 | D3 | D3 | D3 |
| **4 dorms of 3 students:** | D1 | D1 | D1 | D2 | D2 | D2 | D3 | D3 | D3 | D4 | D4 | D4 |

**Notes:** This figure displays three examples of how the randomization to groups was used to allocate students to dorm rooms and classrooms.

## C Psychological Tests

This section describes in detail the psychological tests that were used to construct the sociability index.

In addition to the Big Five personality traits and the peers' perceptions measures described in section 5.1, the tests used to construct the sociability index are:

### C.1 The Big Five

The most widely accepted taxonomy of psychological traits, both in the literature and in my data, is the Big Five (McCrae and John, 1992; John and Srivastava, 1999).[14] The *American Psychology Association Dictionary* defines the Big Five personality traits as follows (Table 1.1 in Almlund et al. (2011)):

1. Conscientiousness: the tendency to be organized, responsible, and hardworking.
2. Openness to Experience: the tendency to be open to new aesthetic, cultural, or intellectual experiences.
3. **Extraversion**: an orientation of one's interests and energies toward the outer world of people and things rather than the inner world of subjective experience; characterized by positive affect and sociability.
4. **Agreeableness**: the tendency to act in a cooperative, unselfish manner.
5. Neuroticism or Emotional Stability: Emotional Stability is "predictability and consistency in emotional reactions, with absence of rapid mood changes." Neuroticism is a chronic level of emotional instability and proneness to psychological distress.

Only two traits from the Big Five are associated with social skills: extraversion[15] and agreeableness[16]. Empirical evidence shows that extraversion is associated with good labor market outcomes (Fletcher, 2013), and that agreeableness influences occupational decisions (Almlund et al., 2011; Cobb-Clark and Tan, 2011). These results are consistent with a study by Deming (2017) that concludes that the labor market increasingly rewards social skills.

### C.2 Altruism

The altrusim self-reported scale was developed by Rushton et al. (1981). The test used in the COAR network is composed of 17 items. The score on the test is found to predict criteria such as peer ratings of altruism, completing an organ donor card, and paper-and-pencil measures of prosocial orientation (Rushton et al., 1981). More recent evidence shows that the score on the test is related to spontaneous smiles—which is an important signal in the formation and maintenance of cooperative relationships (Mehu et al., 2007). Likewise, there is evidence that the score in the test is related to charity giving but not to blood donor donation behavior (Otto and Bolle, 2011).

[14] Almlund et al. (2011) summarizes the Big Five personality traits and their application to economics. Likewise, Akee et al. (2018); Donato et al. (2017); Kranton and Sanders (2017) provide recent evidence of the Big Five in economics research.

[15] The facets of extraversion correspond to: warmth (friendly), gregariousness (sociable), assertiveness (self-confident), activity (energetic), excitement seeking (adventurous), and positive emotions (enthusiastic).

[16] The facets of agreeableness are: trust (forgiving), straight-forwardness (not demanding), altruism (warm), compliance (not stubborn), modesty (not show-off), tender-mindedness (sympathetic).

### C.3 Leadership

The leadership scale corresponds to the leader behavior questionnaire developed in Spanish by Castro-Solano (2007). It is based on the theory of Yukl (2013). The scale measures three components of leadership: (1) behaviors guided towards tasks, (2) behaviors guided towards others, and (3) behaviors guided towards changes. In my data, there is a positive correlation between the score on the scale and the number of peers who perceived the subject as a leader.

### C.4 Empathy

The empathy scale corresponds to the Basic Empathy Scale developed by Jolliffe and Farrington (2006). The scale is composed of two factors: cognitive and emotional empathy. The scale has been validated in other contexts: when applied to adults (Carre et al., 2013) and the Spanish version of it (Villadangos et al., 2016). It has also been affirmed that students who report higher scores in socially aversive personalities (psychopathy, narcissism, and Machiavellianism) have a low score on the scale (Wai and Tiliopoulos, 2012). Likewise, Gambin and Sharp (2018) show that a low score on the test is associated with guilt and depressive symptoms.

### C.5 Intercultural Sensitivity

This 24-item scale of intercultural sensitivity was developed by Chen and Starosta (2000). The authors define intercultural sensitivity as: "*a person's ability to develop a positive emotion towards understanding and appreciating cultural differences that promotes appropriate and effective behavior in intercultural communication.*" The scale is composed of two factors: positive and negative reactions to intercultural interactions. Evidence shows that there is a positive correlation between intercultural sensitivity and compassion in nurses (Arli and Bakan, 2018), that American student scores depend on religious affiliation and the number of times they have traveled outside the US (Gordon and Mwavita, 2018), and that Iranian university students have demonstrated a strong relationship between intercultural sensitivity and ethnic background.

### C.6 Emotional Intelligence

Emotional intelligence is defined as individuals' ability to recognize their own emotions and those of others, discern between different feelings and label them appropriately, use emotional information to guide thinking and behavior, and manage and/or adjust emotions to adapt to environments or achieve one's goal(s) (Colman, 2009). The emotional intelligence test corresponds to the scale developed by Law et al. (2004). The test is composed of 16 items and has four factors: self-emotional appraisal, uses of emotion, regulation of emotion, and others' emotional appraisal.

### C.7 The Read the Mind in the Eyes Test

The objective of this test is to assess how well people can read others' emotions just by looking at pictures of their eyes. It is a multiple choice test with 36 items. For each item, the respondent has to identify the corresponding emotion expressed in a pair of eyes; four choices are given for each question. According to Deming (2017), this test is a reliable measure of social skills since it is positively correlated with performance in groups (Declerck and Bogaert, 2008). However, this measure could potentially have problems due to the cultural differences between the context where the test was developed and the context of my study. In particular, according to the website Lab in the Wild:

socialintelligence.labinthewild.org, the test was developed in Great Britain and the images were taken from British magazines in the 1990s. Therefore, the test may not produce accurate results when administered to people who are not native speakers of English or those who come from cultures that are very different from Britain's.

### C.8 Achievement Goals

While not part of the construction of the social skills index, students completed the *The Achievement Goal Questionnaire* (J. Elliot and Murayama, 2008). Achievement goals are conceptualized as cognitive–dynamic aims that focus on competence. The test is composed of 12 items and has four factors: mastery approach goal items, mastery avoidance goal items, performance-approach goal items, and performance-avoidance goal items. The last two items are related to goals in comparison with peers and are the ones I use to proxy for preferences for competition.