When Teachers Break the Rules: Imitation, Reciprocity, and Community Structure in the Transmission of Ethical Behavior*

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Abstract

We study how teachers' rule violations in grading affect students' ethical behavior. Using administrative data from high-stakes exams, combining teacher-assigned internal scores with externally graded national exam scores, we track teacher grading violations and subsequent student cheating. We explore three potential mechanisms: imitation (learning that rules can be broken), positive reciprocity (responding favorably to favorable treatment), and negative reciprocity (retaliating against unfavorable treatment). Exploiting within-student variation in exposure to different teachers, we find students are significantly more likely to cheat when teachers break the rules to their detriment (systematically undergrading), consistent with both imitation and negative reciprocity. However, when teachers systematically overgrade, responses vary by community structure. In heterogeneous communities, overgrading increases student cheating, suggesting imitation dominates. In homogeneous communities, students respond by cheating less, consistent with positive reciprocity dominating. This pattern holds across multiple homogeneity measures, including surname concentration and residential clustering. Survey measures of mutual respect and support between students and teachers confirm this pattern.

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1. Introduction

Teachers play a central role in shaping students' academic and ethical development. As authority figures and role models, teacher behavior may influence not only student learning but also their ethical standards and integrity. Understanding how teachers' rule violations affect student behavior has important implications for educational outcomes and the broader transmission of ethical norms across generations. Beyond education, these dynamics may offer insights into how community characteristics shape the broader transmission of ethical behavior.

Teachers can affect the long-term development of human capital beyond cognitive skills (Heckman and Rubinstein, 2001; Cunha and Heckman, 2007). While previous research has established that dishonesty in educational environments can have far-reaching consequences (Jacob and Levitt, 2003; Dee and Jacob, 2012; Figlio and Loeb, 2011; Angrist et al., 2017), and exposure to unethical behavior in authority figures can erode trust and encourage similar behavior among subordinates (d'Adda et al., 2017; Ajzenman, 2021), little is known about the dynamics of how teachers' violations of institutional norms influence student cheating, or how community structure shapes this relationship. In this paper, we exploit detailed administrative data that allows us to track teachers' violations of grading rules and subsequent student cheating on high-stakes exams.

We distinguish two forms of teacher rule violations: one that is plausibly perceived as beneficial or indicative of good intentions towards students, and the other as detrimental. We then ask whether, and in what ways, these violations affect students' likelihood of cheating. Intuitively, these two forms of rule-breaking may have different implications. On the one hand, students may learn from observing teacher behavior that rules can be broken, updating their beliefs about what is acceptable or expected (Bandura, 1977; Cialdini & Trost, 1998). Peer influences have been shown to affect academic cheating behavior significantly (Carrell et al., 2008), and teachers may similarly shape students' beliefs about behavioral norms. From this perspective, observing teachers breaking rules should lead students to do the same.

On the other hand, students may also respond based on how the teacher treats them. Thus, it matters whether the teacher's rule violations show good or bad intentions toward the student

(Rabin, 1993; Falk and Fischbacher, 2006; Dufwenberg and Kirchsteiger, 2004). If a student is caught cheating, the consequences can be severe, affecting not only the student but also the teacher, the school community, and the school's reputation. When deciding whether to cheat, students who teachers have mistreated may care less about the potential consequences for others. Students may also feel that teachers who systematically give excessively low grades have broken the "social contract" and may thus seek revenge by breaking the rules themselves. Additionally, students could engage in strategic retaliation: by cheating to achieve higher external scores, they widen the gap between the teacher's internal grade and their actual performance, thereby increasing the probability that the teacher will be sanctioned for violating grading rules. Either way, such negative reciprocity would reinforce the imitation effect, increasing student cheating.

However, if the teacher's behavior, while breaking the rules, shows good intentions towards the student, students may reciprocate by cheating less. This positive reciprocity could mitigate, or even reverse, the imitation effect. We expect such reciprocal behavior to be more prevalent in tight-knit communities, where social bonds are stronger, and expectations of reciprocity are clearer (Bowles and Gintis, 2002; Enke, 2019).

We measure teachers' grading rule violations using systematically large deviations between the "internal" matriculation grades that teachers submit to the Ministry of Education, and students' "external" scores on the national matriculation exam administered by the Ministry. Such deviations are considered improper by the Ministry, which uses an apparatus designed to detect them. When large gaps are observed between the average internal and external grades in a given test/subject, the Ministry imposes significant sanctions on teachers and schools. The rationale for these sanctions is widely understood. Accurate and unbiased internal school grades are considered crucial to the system's integrity, as they affect the comparability of the final matriculation grades across schools and students. Given the high stakes of matriculation grades, which often determine a student's career trajectory (Angrist and Lavy, 2009; Ebenstein et al., 2016), violations can have severe distributional consequences, unfairly advantaging some students over others. We follow the Ministry's policy and treat these violations of the grading protocol as improper teacher behavior that violates institutional norms.

Our main analysis exploits within-student variation in exposure to different teachers. This helps overcome potential correlations between student (or class, school, and locality) characteristics and the likelihood of cheating or of being caught. Importantly, student fixed effects address a concern that students of different genders, abilities, or ethnicities are monitored for cheating differentially. Furthermore, we use variation in teachers' grading rule violations in the preceding year, thereby alleviating concerns about the potential effects of the class's expected performance on teachers' grading policies.

Our findings suggest that when teachers break the rules by giving students exceptionally low internal grades—behavior plausibly perceived as detrimental to students—students are more likely to break the rules themselves by cheating on the respective external exam, consistent with both imitation and negative reciprocity working in the same direction.

However, when teachers break rules to benefit their students, our analysis reveals nuanced responses that vary across community structures. Recall that two mechanisms may be at work in this case: imitation—learning that rules can be broken, which should lead to more cheating when teachers break rules regardless of direction, and positive reciprocity, which should lead to less cheating when teachers break rules favorably. The relative strength of these mechanisms should depend on community structure. Indeed, we find that in homogeneous communities, students exposed to teachers who break rules in their favor tend to cheat less, suggesting that reciprocity dominates imitation in these settings. This reciprocal response to favorable rule-breaking by teachers is robust across multiple measures of school homogeneity, including the prevalence of specific surnames, residential clustering, and the concentration of feeder elementary schools. In contrast, in heterogeneous communities, the effect of favorable rule-breaking resembles that of detrimental rule-breaking: both types increase the likelihood of student cheating, suggesting that imitation is a dominant factor in these settings. However, the effect of detrimental rule-breaking remains quantitatively larger.

We further explore these patterns by analyzing students' responses to survey questions about the teacher-student relationship at school. We focus on questions that capture reciprocity and support between teachers and students. We use four survey items measuring whether teachers

encourage struggling students, provide help when needed, maintain good relationships with students, and show mutual respect. Using these measures separately or as a summary index shows the same pattern as our homogeneity indices. Specifically, communities characterized by stronger mutual support and respect between teachers and students are associated with students cheating less when teachers do not comply with institutional grading rules in ways that favor students. In contrast, in communities with weaker teacher-student relationships, teachers' favorable deviations from grading regulations do not reduce student cheating, consistent with our findings that community structure influences ethical transmission.

We consider several alternative explanations for these findings. One possibility is that homogeneous schools, where favorable rule-breaking by teachers tends to be associated with reduced student cheating, face a higher risk of sanctions. These sanctions might deter student cheating directly. However, while we find that the likelihood of cheating decreases when schools have been sanctioned in the preceding year, the response to teachers' rule violations remains robust even after controlling for prior sanctions. Another potential mechanism is that students who receive favorably inflated grades have less incentive to risk these grades by cheating. Indeed, we find that higher internal grades are correlated with a lower likelihood of cheating, yet controlling for internal grades does not alter the observed pattern of responses to teachers' rule violations.

The paper contributes to three main strands of the literature. First, our study contributes to the economics of education literature, particularly from a human capital perspective. It highlights how teacher's behavior and the integrity of educational environments can affect the development of students' academic skills and ethical standards, which are critical components of human capital formation. This builds on work examining how educational environments shape non-cognitive skills (Heckman and Kautz, 2012; Deming, 2017) and the importance of these skills for long-term outcomes (Chetty et al., 2014; Jackson, 2018). Our work complements studies on teacher quality that focus primarily on academic achievement (Rockoff, 2004; Rothstein, 2010; Chetty et al., 2014) by examining how teachers may influence ethical behavior and social norms. It also relates to recent work showing how teachers' biased grading behavior can affect students' academic

outcomes and choices (Lavy and Megalokonomou, 2024; Alesina et al., 2024), and how ingroup biases can affect marking on high-stakes exams (Lavy, Shayo, and Sand, 2022).

Second, a large body of literature examines dishonest and unethical behavior. Given the difficulty of observing dishonest behavior in naturally occurring data, let alone identifying its determinants, researchers have turned mainly to lab experiments (Fischbacher and Föllmi-Heusi, 2013; Gneezy, 2005; Abeler et al., 2019) as well as lab-in-the-field experiments (Gächter and Schulz, 2016; Cohn et al., 2014; Cohn et al., 2015).[1] These studies have revealed several factors that influence the likelihood of dishonest behavior, including group norms (Bicchieri and Xiao, 2009; Lefebvre et al., 2015), competitive environments (Charness et al., 2014), and cultural influences (Barr and Serra, 2010). Notably, d'Adda et al. (2017) have shown that leaders can influence ethical conduct in short-term lab interactions, and Dimant (2019) has shown that antisocial behavior spreads more readily among socially proximate peers in a lab setting. However, evidence on the transmission of dishonest behavior from authority figures to subordinates in naturally occurring high-stakes decisions is limited. Our paper addresses this gap by examining the causal impact of teachers' violations of institutional grading rules on student cheating in high-stakes educational contexts.

Third, we contribute to the literature on the role of community structure in shaping moral behavior. Cultural economics research has demonstrated that social structures influence ethical and cooperative behavior (Guiso et al., 2008; Tabellini, 2008; Raz, 2025). The strength of norm enforcement varies systematically across societies, with "tight" cultures exhibiting stronger norms and sanctions than "loose" cultures (Gelfand et al., 2006). Particularly relevant is work showing that kinship-based societies often develop different moral standards than those found in more individualistic contexts (Enke, 2019; Henrich, 2020). We find that in homogeneous communities—including kinship-based communities, as measured by the prevalence of specific surnames—

[1] Studies documenting dishonesty in naturally occurring data include Jacob & Levitt (2003), who use unusual test score fluctuations and suspicious answer patterns to detect teacher cheating; Ferraz & Finan (2008, 2011) who use random corruption audits in Brazilian municipalities; Gulino & Masera (2023) who use random audits at self-service supermarket checkouts in Italy; and Martinez (2022) and Karlinsky and Shayo (2026), who study information manipulation by governments.

students are less inclined to cheat when teachers break rules in their favor. This is consistent with research showing that homogeneous societies with strong kinship ties often develop and enforce cooperation norms that rely heavily on reciprocity (Bowles and Gintis, 2002; Leung and Bond, 1984).

In contrast, in heterogeneous communities, both types of teacher rule-breaking lead to more student cheating, suggesting that imitation dominates reciprocity in these contexts. These findings align with evidence that more diverse societies often rely on different enforcement mechanisms for cooperative behavior (Henrich et al., 2010; Greif, 1994). Our study thus provides novel evidence on how community structure mediates the transmission of ethical behavior across generations, with implications for understanding moral contagion in educational settings and, potentially, in other institutional contexts.

2. Institutional Background

Israeli high school students are enrolled either in an academic track leading to a matriculation certificate (Bagrut) or an alternative track leading only to a high school diploma.[2] The Bagrut is completed by passing a series of national exams administered to students between 10th and 12th grade. Thus, Bagrut certificates are typically obtained at the end of the senior year (twelfth grade) or later. Students take courses (and respective tests) at various proficiency levels, with each test awarding 1 to 5 credit units per subject, depending on proficiency. Some subjects are mandatory and must be taken for at least 3 credits. A minimum of 21 credits is required to qualify for a Bagrut certificate. The final matriculation score in a given subject is the mean of the test scores in a school-level ("internal") exam and a national ("external") exam. The latter is graded independently by

[2] This study focuses on the two main sectors of the Israeli education system. In the first the language of instruction is Hebrew, and most students are Jewish. In the second, the language of instruction is Arabic, and all students are Arab. We exclude from the study a third sector, which includes the Jewish ultraorthodox population in Israel. Most schools in this sector do not follow the national curriculum and do not participate in the Bagrut matriculation system. Within the first sector, schools can belong to two distinct segments according to the level of religiosity. "State schools" are secular and serve the secular Jewish population. "State-religious schools" serve mainly the religious Jewish population and in some subjects follow a different curriculum.

two external examiners. In the period we studied, about 61% of matriculation examinees received a matriculation certificate (CBS data[3]).

The Bagrut matriculation certificate is a prerequisite for university admission, and receiving it is one of the most economically important educational milestones. It is similar to high school matriculation exams such as the French Baccalaureate, the German Abitur, the Italian Diploma di Maturità, and the New York State Regents examinations. The Bagrut can be understood as a "college-bound" indicator in the American vernacular. Most Israeli students who fail to complete a Bagrut still finish their secondary schooling. Nevertheless, post-secondary schooling options for high school graduates without a Bagrut are limited, and very few will pursue further education. Even institutions that are not otherwise very selective, such as teachers' colleges and two-year professional programs for nursing, optometry, and computer programming, favor applicants with a Bagrut certificate. Accordingly, evidence from the Israeli census suggests that holding a Bagrut yields high economic returns (Angrist and Lavy 2009).

2.1 Exam Integrity: Student Cheating and Consequences

During the external exam, proctors note suspected violations of exam integrity or cheating. These can include possession of unauthorized materials, collaboration between examinees, receiving assistance, disruption of exam conditions, theft of a questionnaire, failure to report a stolen exam, and possession of electronic devices.

There are three additional stages where suspicion of cheating can be raised. First, Ministry inspection teams that randomly visit schools during exams can file charges against an examinee or a member of the school's administrative or educational staff for violating exam integrity. Second, if identical answers, parallel mistakes, or a lack of detail are found during scanning all notebooks, those notebooks will be marked as suspect. Third, during the marking by the two external examiners, the latter receive the seating arrangements in the exam classroom and can

[3] https://www.cbs.gov.il/he/publications/LochutTlushim/2023/st04_20.pdf

therefore detect similar exam papers and signs of cheating. Suspicion of a lack of exam integrity in a matriculation exam can lead to the disqualification of the exam.

Handling Suspect Cases: If a proctor observes inappropriate behavior, either the proctor, the supervision coordinator, the inspector, or the head of the examination center fills out a detailed report on the incident during the exam or immediately after its conclusion. This report serves as evidence when making future disciplinary decisions. The course of action—whether to stop the exam or allow it to continue—depends on the nature of the suspicion, as detailed in section 4.4 of the Ministry reference (Director General's Circular – Exam Integrity).[4]

Generally, every student has the right to appeal. If, at the end of the investigation and the appeal review process, the student is held to have violated exam integrity, the exam for that period is disqualified. One or more disciplinary actions will be taken against the student, such as disqualifying the exam and suspension of their eligibility for a matriculation certificate until they retake the exam in the same subject or questionnaire in which they were disqualified, depending on the nature and severity of the offense. If the suspicion concerns technological means, such as the use of a mobile phone, the student is prevented from taking the exam in that subject for at least 1 year. Suspension can carry over to several future exam periods, meaning the student will not have the opportunity to take this exam during those periods (varies by subject).

A student who violated the exam protocol in more than one subject is not permitted to retake the subjects for which they were disqualified for three years from the date of disqualification. Cases of severe and exceptional incidents of exam integrity violations by examinees can lead to suspension of the examinee from taking exams in all remaining subjects for up to three years, disqualification of exams that the examinee has taken so far, suspension of eligibility for a matriculation certificate or completion certificate for up to three years, and filing a complaint with the police.

School-level consequences when breaching exam integrity code: The Ministry classifies schools into three tracks – red, yellow, and green – each with specific examination management

[4] https://apps.education.gov.il/mankal/horaa.aspx?siduri=512h

procedures. Red Track: Schools are classified in the Red Track if 3% or more of their exam papers were disqualified over the past two of the last three years or if significant and severe violations of examination integrity were identified. Such schools are prohibited from independently managing matriculation exams. In exceptional cases, exams are held outside school premises at an external examination center. Schools in this track must undertake significant corrective measures to ensure compliance with regulations and improve their integrity to achieve green status. Yellow Track: Schools with unsatisfactory adherence to examination integrity. Schools are classified in this track if, over the past two or three years, 1.1% to 2.9% of their exam papers were disqualified, or if there were significant procedural violations. Schools in this track should view their classification as a warning sign and intensify efforts to uphold examination integrity to achieve green status. Green Track: Schools that had no breaches of examination integrity or exhibited minimal violations.[5]

2.2 Grading Code: Teacher Rule Violations, and Their Consequences

The Ministry of Education rules determine that the gap within a given exam is exceptionally high if either (i) the school's average internal grade exceeds the average external exam score by more than 20 points (an overly "lenient" school), or (ii) if the external exam score average exceeds the school's average internal grade by more than 12 points (an overly "strict" school).[6] In such cases, the sanction is that the final grade in this exam (in the same year) for all students is recalculated according to new weighting: 90% for the external exam score and 10% for the internal school score. Suppose a violation of the grading code is repeated in consecutive years or several exams. In that case, the sanction is that the school 'loses' the privilege to issue internal school grades in all exams for two years. Therefore, the final matriculation grade is based solely on the national external exam during this period.

School-Level Consequences: Beyond limiting the teacher's input in determining the final matriculation grade, the Ministry also announces these sanctions publicly, which affects the school's reputation. The sanction may further affect school enrollment because the students lose

[5] https://apps.education.gov.il/mankal/horaa.aspx?siduri=512#_Toc256000051
[6] https://mosdot.education.gov.il/students/matriculation/shaked/

a significant privilege in determining final matriculation diploma grades, which can significantly impact their future post-secondary schooling options. This creates strong incentives for schools to sanction teachers who violate grading rules.

Measuring Teachers' Rule Violations: We measure grading code violations by averaging the difference between school and national scores for each combination of school, year, and exam code. Note that some subjects have more than one teacher teaching the courses leading to a specific exam. This is particularly likely in the compulsory math and English subjects. In this case, the measure we use does not uniquely identify the rule violations of one specific teacher. Thus, we consider this difference as a proxy for the ethical climate induced by the teaching faculty of the specific subject. We view the average difference between the external and the school test scores as potentially endogenous to student behavior. Therefore, we use the lagged teacher violations from year *t-1*, rather than the contemporaneous measure at year t of the exam. We return to this point in the methodology section below.

3. Data

We start by combining student-level data from two main administrative data files obtained from the Israeli Ministry of Education. The first dataset includes matriculation exam scores and an indicator of disqualification due to cheating for five consecutive 12th-grade cohorts (1998-2002). The final matriculation grade in each subject is typically the average of the external and internal exam scores. The school score is based on an exam similar to the national one administered in the weeks preceding the national exams. The second dataset includes students' demographic and socio-economic information, such as gender, parental education levels, number of siblings, year of immigration (if applicable), and ethnicity.

We merge the student-level datasets with administrative information at the school level, including indicators of co-ed or single-sex schools, sector of study programs (Jewish or Arab), and school communities.

Next, we use a Ministry dataset that documents sanctions imposed on schools during these years for violations of the grading code, specifically, unusually high differences between the average national exam score and the average school score.

As noted above, we use lagged teacher violations at t-1 rather than the contemporaneous measure at year t to avoid concerns about reverse causality. However, in 1997 (the year before our detailed exam data began), three subjects were excluded from the national external matriculation exams and therefore had missing external scores.[7] For these subjects, we use the 1996 measure of teacher violations rather than the 1997 measure. Since, in most cases, the teachers in 1996 were the same as those in 1997, this imputation is unlikely to generate a critical measurement error.

3.1 Community Homogeneity and Student-Teacher Relations

We use several measures of community ties and school or locality homogeneity. Start with homogeneity. Let p_{ij} be the proportion of students in a given school j (or the population in locality j) who have some attribute i. For example, the proportion of students in a school j who have the same family name i, where $\sum_i p_{ij} = 1$. We employ two types of indices.

1. A Herfindahl-Hirschman Index (HHI): the probability that two randomly drawn students from a school or locality j share the same attribute: $HHI_j = \sum_i p_{ij}^2$.

2. Concentration Ratio: the share $CR_j(N)$ of the population in the school or locality j that has one of the N most common attribute values.[8] For example, the Central Bureau of Statistics (CBS) publishes a measure of surname homogeneity within localities. For each locality, the CBS computed (in 2017) the share of the population covered by the top 4 surnames.

Both indices range from 0 to 1, with higher values indicating more homogeneous populations.

[7] This resulted from a policy during 1995-1997, where exams in some compulsory subjects were canceled in order to reduce the number of exams taken at the end of 12th grade. The Ministry of Education used a lottery to determine which three of the seven compulsory subjects would be canceled each year. In 1997, the national exams in History, Civic Studies, and Hebrew were canceled.

[8] Specifically, for each school or locality j, sort the attributes from highest to lowest p_{ij}. Then calculate for every school (or locality) j the share $CR_j(N) = \sum_{i=1}^{N} p_{ij}$.

We start with simple indices measuring the geographical concentration of students in a school by computing both an HHI and a $CR_j(1)$ index based on the zip code of the student's home address, obtained from the Ministry of Education.[9] Next, to proxy for kinship ties, we follow the CBS and compute a $CR_j(4)$ name homogeneity index at the school level, using surname data obtained from the Ministry of Education. We use both our and the CBS index to examine whether the relationship between teachers' and students' ethics is associated with kinship ties within the community and the school. Finally, we compute an HHI index based on the primary schools that feed each secondary school. Primary schools typically serve a specific neighborhood. A high school that serves a population from a smaller set of feeding primary schools is, in this sense, socially and geographically more homogeneous.[10]

One limitation of these measures of homogeneity is that they are based purely on student characteristics. As such, they are imperfect proxies for the school community's tightness and cohesiveness. To complement them, we employ survey-based measures of student-teacher relations within schools. Specifically, we use information from the GEMS (Growth and Effectiveness Measures for Schools—Meizav in Hebrew) student survey for the years 2002-2005. The GEMS includes student questionnaires administered by the Ministry of Education's Division of Evaluation and Measurement and covers various aspects of the school and learning environment.[11] While these survey questions are not available at the high school level, we can employ the middle school GEMS to gauge the overall teacher-student relationship within the locality.

For each of the two statements below, middle-school students are asked to indicate "what share of the teachers that teach you fit" the statement, on a scale from 1 (almost none of the teachers) to

[9] In cases where a student has more than one zip code, we used his zip code during 12th grade, where he did most of his exams.

[10] This is a coarser measure of sheer geographical homogeneity than the Home address HHI, which is based on (finer) zip codes, but it may potentially capture other dimensions of homogeneity.

[11] The GEMS is administered at the midterm of each school year to a representative 1-in-2 sample of all elementary and middle schools in Israel, so that each school participates in GEMS once every two years.

5 (a large share of teachers) and 6 (almost all teachers). We report the overall share of students choosing either 5 or 6 in parentheses.

- [Q25] When a student fails, the teachers encourage them to try again. (Share 5/6 =.348)
- [Q26] Teachers always help me when I need assistance in my studies. (Share 5/6 =.439)

Students are further asked to rate the following statements about their school on a scale from 1 (not at all true) to 5 (true) and 6 (very true):

- [Q43] There are good relations between teachers and students. (Share 5/6 =.375)
- [Q44] There is mutual respect between teachers and students. (Share 5/6 =.389)
- [Q40] Sometimes teachers treat me in an offensive and hurtful way. (Share 1/2 =.362)
- [Q41] I feel good in class socially. (Share 5/6 =.75)
- [Q42] The students in the class help each other. (Share 5/6 =.486)
- [Q45] When I have a problem, I have someone to turn to at school (teachers, counselor). (Share 5/6 =.568)

For each of these items, we compute the share of students in the locality who answer 5 or 6, except for item Q40, where we use the share answering 1 or 2 (i.e., not at all true or not true). The first four of these items (25, 26, 43, 44) seem especially pertinent for capturing possible teacher-student norms of reciprocity, but we also report results using a summary index of all eight items.

3.2 Descriptive Statistics

Table 1 presents the means and standard deviations of key variables used in our analysis for the full sample and for males and females separately. Girls constitute a larger share because of higher dropout rates among boys in high school. Table A1 in the online appendix presents the detailed means and standard deviations for all variables used in this study.

Panel A in Table 1 and Table A1 report the means of student characteristics. Parental years of schooling are about 11.2 for fathers and 11.0 for mothers. On average, students take approximately 10 matriculation exams (over their 10th-12th grade years), with slightly more for girls. Interestingly, girls perform better in both internal school exams and external national

exams. On average, girls achieve higher school scores by approximately 3.5 points and higher national exam scores by about 2.6 points (both scores range from 0 to 100).

Panel B in both tables shows the means of two student cheating indicators. The share of disqualified exams is 0.5 percent, with no substantial differences across genders. Approximately 4.3 percent of students are disqualified due to cheating at least once during their high school years.

Panel C presents indicators for teacher rule violations. The average difference between the (internal) school score and the (external) national score is about 4.7 points (Table A1). Thus, teachers tend to be somewhat lenient. The mean *absolute* difference in scores is 6.9 points. Turning to the more severe violations, we present in panel C of Table 1 the proportions of exams graded 10 points or more above the national score ("positive 10-point difference" in subsequent tables) and those graded 10 points or more below the national score ("negative 10-point difference"). We also show proportions using the 20-point and 12-point cutoffs used by the Ministry of Education for sanctioning. Approximately 21 percent of exams are 'positively 10-graded'. The discrepancy is considerably smaller using the 20-point cutoffs, 3 percent. Negative (overly harsh) grading is far less prevalent: 2.5 percent are 'negatively 10-graded,' and 1.6 percent are 'negatively 12-graded'.

Panel D in Table A1 reports statistics regarding Ministry of Education sanctions imposed on schools for teacher violations of the grading code. For approximately 1.5 percent of the exams, the school was sanctioned last year for this specific exam code. Additionally, in about 75 percent of the cases, schools were sanctioned at least once in the preceding five years. There are no significant differences in student gender across Panels C and D.

Panel E in Table A1 reports descriptive statistics on community and school homogeneity measures. The mean homogeneity of locality family names indicates that, on average, 9.4% of the locality population is covered by the top 4 surnames, with a standard deviation of 13%. When measured at the school level, this mean is 10.3 percent. The community- and school-level measures of surname commonality are highly correlated (r = 0.934). The school-level zip code homogeneity index (HHI) mean is 0.135, and the share of the most common zip code is 19.6% on

average. The feeding elementary school homogeneity index mean is 0.178. In the online appendix Table A2, we demonstrate that the various homogeneity measures described above are highly correlated. For example, the Pearson correlation coefficient between the school-level zip codes' HHI and the average share of the school's 4 most common family names is 0.778. The correlation between the school-level zip codes' HHI and the number of elementary schools that feed into the secondary school is 0.496.

Finally, Panel F in Table A1 presents the locality-level means for each of the eight questions that characterize various aspects of the teacher-student reciprocity relationship. It also presents the means of two indices in the bottom two rows, the first based on the first four questions and the second based on all eight questions.

4. Empirical Model

Our primary analysis leverages the within-student variation in exposure to different teachers across various subjects. This strategy addresses any potential correlations between the student's (or the class or school's) characteristics and the likelihood of cheating or being caught. Importantly, including student fixed effects addresses a concern that students of different genders, abilities, or ethnicities may be monitored for cheating differentially. Since students may switch schools, school fixed effects further address other school-level confounding factors. For example, some schools may have a lax culture around grading rules or may be subject to stricter enforcement. We also include fixed effects for exam codes — i.e., the subject, specific sub-materials, and levels — as certain subjects may be more susceptible to grading rule violations, student cheating, or inadequate monitoring.

We measure teachers' grading rule violations by calculating the average difference between the internal and external exam scores for each exam code. Note that at the time of filing the internal grade, teachers do not know what the precise average external grade is going to be. Hence, small deviations from the external grade are to be expected and should probably not be considered a violation of the rules. Indeed, as noted in Section 2.2, the Ministry formally considers the gap a violation warranting sanctions only when exceptionally large. Accordingly, in our main specifications, we measure these violations using simple dummy indicators based on thresholds

of +10 (indicating overly lenient grading that risks violating the rules) and -10 (indicating overly strict grading). Nonetheless, we also report all the results using the simple continuous difference (Table 2 and Appendix Tables B1-B5).

Throughout, we use the gap between internal and external scores in the preceding year. This is designed to overcome endogenous feedback mechanisms from students to teachers. For example, teachers may give low grades to students who are likely to cheat. Since the same teachers typically teach the same subject for many years, measures of grading rule violations are indeed strongly correlated within exam code and school over time (See evidence in online appendix Table A3).

Our baseline regression takes the following form:

$$Y_{ijet} = \beta_0 + \beta_1 UP_{je,t-1} + \beta_2 DOWN_{je,t-1} + X_i' \delta + FE + \gamma_1 SLY_{je,t-1} + \gamma_2 ISS_{ijet} + u_{ijet} \qquad (1)$$

where Y_{ijet} is an indicator for exam disqualification of student *i*, in school *j*, in exam code (i.e., subject and level) *e*, in year *t*. $UP_{je,t-1}$ is our measure of upward (overly lenient) grading violation in school *j* and exam code *e* in year *t-1. S*imilarly, $DOWN_{je,t-1}$ is a measure of downward (overly strict) grading violation. X_i is a vector of student characteristics. *FE* is shorthand for a set of fixed effects which, in the complete specification, includes cohort, exam period, exam code, school, and student fixed effects.[12] We also include an indicator, SLYje,t-1, indicating whether the school was sanctioned last year (i.e., in *t-1*) for teacher violation of the grading code in the same exam code. Finally, ISS_{ijet}, is the internal school score for student *i* in school *j* in exam *e* in year t. This score is known to the student at the time of the exam and may potentially affect their likelihood of cheating. u_{ijet} is an unobserved error term, clustered at the school-by-exam-code level.

In the full specification, β_1 and β_2 thus capture the within-individual difference in the likelihood that one's exam is disqualified across subjects, according to the teacher's grading violations in the preceding year in those subjects, while controlling for subject fixed effects. β_1 captures the difference (relative to an unbiased teacher) when the teacher violated the grading code in favor

[12] The school fixed effects are largely redundant once we include student fixed effects, as few students switch schools. Nonetheless, it will be instructive to see results that include only the former.

of the students, whereas β_2 captures the difference if the teacher's violation is detrimental to the students.

It is important to emphasize that we use variation in teachers' *average* grading behavior, and that our estimate of the effect of the teacher's grading rule violations is not confounded by how the teacher treats the specific student. This measure of teachers' grading violations is likely correlated with other aspects of teachers' ethical conduct that students observe, such as their actions, words, and classroom conduct, including respect and fairness. Thus, our estimates reflect the effect of the general `image' or `impression' that overly lenient or overly strict teachers create, rather than the effect of how the teacher specifically treated the student. Indeed, we control for the grade the student received from the teacher.

To explore the role of community structure, we augment Equation 1 with interaction terms between the UP and DOWN indicators and the measures of homogeneity and community ties described in the data section above.

5. Results

We start by looking at the raw data. Figure 1 shows the proportion of disqualified exams by teacher rule violations in the same exam code and school in the preceding year. The different panels further break the sample using different homogeneity measures. Start with the left panel, which uses the CBS measure of surname homogeneity of the locality where the school is located. The right three bars show disqualification rates in relatively homogeneous communities: localities where more than half the families have one of the four most common surnames in the locality. The left set of bars shows all other communities. Overall, homogeneous communities tend to have more cheating than heterogeneous communities, which is one reason our main analysis includes school fixed effects. The more interesting pattern, however, is the relationship with teachers' grading rule violations *within* communities. In relatively heterogeneous communities, we observe that disqualification rates are lowest where there is no evidence of teacher improper behavior. Disqualification rates are higher on average in subjects where the teacher violated the rules, especially when the teacher was overly harsh (i.e., systematically gave lower internal grades than external grades). Turning to homogeneous communities, however, we

observe a strikingly different pattern. Disqualification is again highest when the teacher is excessively harsh, but it is, in fact, lowest when the teacher is excessively lenient. This is consistent with the idea that, at least in tight-knit, kinship-based communities, imitation is not the only channel through which ethical behavior is transmitted.

A similar pattern is observed across other measures of school homogeneity. For example, the right panel splits schools by the homogeneity of their student body in terms of their home address. Heterogeneous schools experience more cheating in subjects where teachers exhibit rule violations. However, while more homogeneous schools show an increase in cheating when teachers are overly strict, they show a decrease when teachers are overly lenient.

This section examines these patterns in detail, starting with the overall transmission pattern and then focusing on the role of community homogeneity. The next section examines student-teacher relations within the community more directly.

5.1 When Teachers Break the Rules: The Overall Pattern

From Figure 1, it is unclear how much of the observed patterns are due to systematic differences across localities, schools, subjects, and students – differences that may be correlated with both teacher and student behavior. Different monitoring and sanctioning policies across communities or subjects may also affect the observed patterns. To address these issues, we start in Table 2 by estimating Equation (1) for the entire sample. In panel A, we use our preferred (binary) measure of rule violation, based on a difference of more than 10 points between the internal and external average grades. Panel B reports results using the simple (continuous) difference (the negative difference is in absolute value terms). The first column controls only for cohort and exam-period fixed effects. Column 2 adds student demographic characteristics, and Column 3 adds exam-code fixed effects. The estimates show a positive and statistically significant association between the likelihood of exam disqualification and both positive and negative teacher rule violations. Consistent with Figure 1, the association is much stronger for the negative violations (the difference is statistically significant).

Column 4 further includes school-fixed effects. This erodes both treatment estimates. In fact, the estimated coefficient on positive teacher violations is now essentially zero, regardless of how we measure violations. This suggests that an important part of the correlation observed in Figure 1 may be due to differences across schools (or communities). In particular, some schools appear more likely to both upwardly bias students' internal grades and to have students caught cheating on exams. Using within-school variation, only the effect of negative teacher violations remains significant.

Column 5 adds student-fixed effects, thereby relying on within-student variation in exposure to different teachers. This provides our first result. Students are, on average, more likely to be caught cheating in those exams where the teacher has been overly harsh. Note that including the student fixed effect suggests that this is unlikely to be due to differential or selective enforcement of the rules, for example, based on gender or ethnicity. This supports the interpretation that students are more likely to cheat when exposed to excessively harsh teachers. At the same time, on average, students are not more likely to cheat if the teacher is perceived as willing to break rules in their favor.

There are two main concerns regarding the above interpretation of a causal effect of teacher marking behavior on student cheating. First, the Ministry of Education may have sanctioned schools where teachers violated the grading code in the preceding year. Such sanctions may directly affect student behavior in those subjects where the violation occurred.[13] In column 6 of Table 2, we control for whether the school was sanctioned in the previous year for ethical violations in the same exam code. The estimates suggest that being sanctioned last year may be negatively associated with exam disqualification, though the association is noisy. However, this does not meaningfully affect the estimated coefficients for the two teacher-violation indicators.

A second, and more important, concern is that the student's decision about whether to cheat on the exam may be influenced by their internal grade, which is known prior to the exam. One

[13] The sanctions may also affect teacher behavior in the current year, thereby indirectly affecting student behavior. Indeed, as we show in online appendix Table A4, within school and exam code, being sanctioned last year is negatively associated with being sanctioned this year.

possibility is that a student may hesitate to risk being caught and losing a good internal grade. Conversely, if the internal grade is low, the student might decide that they have little to lose: they may as well take the risk and cheat in the exam. This would generate a positive association between having a harsh teacher and cheating. In Column 7 of Table 2, we include the student's internal school score in the regression. As expected, the likelihood of exam disqualification is indeed significantly lower (within a student) the higher the internal score. However, the estimated effects of teacher violations remain essentially unaffected. This is also true in the last specification, where we include both controls.

Controlling for the student's internal school score also accounts for a second possibility. A student who received an internal score higher than they deserved may conceivably be incentivized to cheat in an attempt to narrow the gap with their external score, thereby reducing the likelihood of a sanction (which would imply a lower weight on the internal score). Conversely, suppose they received a lower school grade than they deserved; this can create an incentive to cheat to increase the gap between the average school and the external scores, thereby increasing the likelihood of a sanction that would reduce the weight of the internal score. Both of these channels are controlled for by including the internal school score in the regression.

5.2 Potential Mechanisms

The results in Table 2 reveal a nuanced relationship between teacher rule violations and student cheating behavior. When teachers exhibit negative violations (systematically giving lower internal than external scores), students are significantly more likely to cheat. This is consistent with two potential mechanisms. First, imitation: students may learn from observing teachers that rules can be broken.[14] Second, negative reciprocity: students who have been mistreated may reciprocate by breaking rules themselves, through the mechanisms discussed in the Introduction. When teachers harm students through negative violations, imitation, and negative reciprocity,

[14] Bandura (1977) emphasizes the role of observational learning and imitation, explaining how students learn behaviors and ethical standards by observing and emulating significant figures, including teachers. See also Dee et. al. (2019).

both act in the same direction, increasing student cheating. However, in the case of positive teacher violations (giving systematically higher internal grades than warranted), imitation and reciprocity work in opposite directions. The imitation effect tends to increase cheating, while positive reciprocity leads students to cheat less. Indeed, Table 2 suggests that, in the population as a whole, the two effects may cancel each other out: the estimated coefficient is an order of magnitude smaller for positive violations and is not statistically different from zero.

5.3 The Role of Community Homogeneity

To investigate these mechanisms, we leverage the idea that norms of reciprocity are more prevalent in tightly-knit, homogeneous communities. These communities often exhibit stronger reciprocal norms and place greater emphasis on within-group cooperation (Bowles and Gintis, 2004; Enke, 2019; Henrich et al., 2010). We utilize several complementary measures of school or community homogeneity for this analysis (see details in the data section above).

We begin in Table 3 with the homogeneity of the school by student home zip code. This captures school homogeneity in terms of students residing in close geographical proximity, within the same neighborhood. Table 3, columns 1-3, presents the estimates when we interact the two treatment variables with the school zip code HHI. In columns 4-6, we interact the two treatments with the share of students in the school who reside in the most common zip-code in the school. All regressions include the full set of cohorts, period, exam code, school, and student fixed effects. In all six columns, the estimates of the ten-point difference, whether positive or negative, are positive and statistically significant. These estimates are not sensitive to the controls added in columns 2-3 and 5-6. These results imply that, in zero-homogeneity schools, the effect of teachers' violations, whether favorable or unfavorable to students, is to increase students' cheating on exams. However, the interaction term estimate of the positive ten-point difference with the homogeneity index is negative and precise. The implication is that the effect decreases as the homogeneity index increases and eventually becomes negative. For example, the effect equals zero when the share of the most common zip code equals 0.3 (recall that its mean is 0.196) and remains negative thereafter. When the share is one-half, the estimated effect is -0.001.

In Table 4, we present results obtained using two additional homogeneity dimensions. The first is the commonality in family names within the community or the school. This measure is meant to capture the strength of familial ties and of clan culture. Clan culture typically refers to the social structure and traditions of a group of people united by kinship and often living in proximity to one another. Clan culture emphasizes strong familial ties and a sense of belonging based on shared ancestry. Members often feel a sense of loyalty and responsibility towards their clan, and there are strong norms of reciprocity and mutual aid. In Israel, despite modernization and urbanization, clan traditions and customs persist in many communities. The evidence in the first two columns of Table 4 is consistent with this pattern. As with geographical homogeneity, the more homogeneous the school or community in terms of the share of the four most common family names in the locality/school, the more negative is the effect of teachers' 'positive' rule violations on students' likelihood of cheating in matriculation exams.

Finally, the last column in Table 4 examines the homogeneity of the high school in terms of the HHI of elementary schools that feed it. The results are qualitatively similar, but somewhat less precisely estimated.

To see these results more clearly, Table 5 presents separate estimates for relatively non-homogeneous and homogeneous localities, using three of the above measures. The results reveal striking differences between these community types. In non-homogeneous communities (columns 1, 3, 5), both positive and negative teacher violations increase student cheating, with the effect of negative violations more than twice as large as that of positive violations. These effects are robust to controls for school sanctions and internal grades (results not shown in the table). In contrast, homogeneous communities (columns 2, 4, 6) show qualitatively different patterns. Positive teacher violations significantly *reduce* student cheating, with coefficients of -0.0079, -0.0101, and -0.0043, respectively. Negative teacher violations increase cheating, with coefficients of 0.0240, 0.0279, and 0.0076. These opposing effects are both statistically significant and substantial in magnitude. Interestingly, the effects of *negative* teacher violations also tend to be larger in homogeneous communities. This is again consistent with stronger norms of reciprocity – in this case, negative reciprocity – in these communities.

Appendix Tables B1-B3 repeat the analyses using the continuous measure of rule violations. Results are qualitatively very similar.

An additional interesting finding in Tables 2-4 is that sanctioning the school in a particular exam code last year is associated with reduced cheating (in that school and exam code) in the following year; however, this effect is not precisely measured. When we further stratify the sample by community homogeneity, we find that the homogeneous communities largely drive this effect. The estimate in the homogeneous sample, shown in column 2 of Table 5, is -0.0198 (SE = 0.0092), whereas in the non-homogeneous sample, it is much smaller, at -0.0011 (SE = 0.0011). The same pattern is seen in columns 3 and 4. Can this pattern also be explained by stronger norms of reciprocity in homogeneous communities? In such communities, students may cheat less to protect their school and teachers from further sanctions.[15]

5.4 Heterogeneity by Gender

Table 6 examines gender differences in these patterns. We present estimates from separate samples of boys and girls, based on the model with interaction terms for homogeneity. We present evidence using three measures of homogeneity: the school-zip-code HHI (columns 1-2), the schools' most common zip codes (columns 3-4), and the school-family-name homogeneity index (columns 5-6). The results across all three measures are consistent: there are no gender differences in the effects of teachers' ethics, nor in their interactions with community structure. Both boys and girls are more likely to cheat in response to negative teacher violations, but the effect reverses for positive violations in homogeneous communities. Appendix Table B4 shows similar results using the continuous measure of rule violations.

[15] In Tables A4 in the online appendix, we present results from regressions where the dependent variable is 'sanctions in year t' and the regressor is 'sanctions in year t-1'. The unit of observation is the Exam Code*X*Year. The estimates show that in homogeneous and non-homogeneous localities, sanctions at year t-1 lower the likelihood of sanctions at year t by about 20 percent. These estimates are quite the same across all samples and regressions. The interpretation is that teachers do respond to sanctions and comply with grading rules more closely once caught violating the grading rules. This is even the case in homogeneous communities with strong reciprocity norms. The interpretation is that among adults (the teachers), the 'deterring' effect of sanctions once caught violating the marking ethical code somewhat lowers the reciprocity commitment in a homogeneous community.

6. Tight-Knit Communities and Student-Teacher Relations

The evidence so far suggests that reciprocity — both positive and negative — is especially important in homogeneous localities. This pattern likely reflects tight social ties within the community. We therefore hypothesize that it should also be reflected in the relationship between teachers and students in schools within the community.

To that end, we use the data from the 2002-2005 GEMS middle school student surveys on the teacher-student relationship (see the data section for details and exact wording). We first focus on the four items that mostly reflect mutual respect and support between teachers and students. Therefore, they are likely good proxies for the reciprocity between teachers and students. The items ask whether teachers encourage students to try again when they fail; whether they always help when you need assistance; whether there are good relationships between teachers and students in the school; and whether there is mutual respect between them. We use the proportion of 7th-9th-grade students who agree with these statements (those who answered 5 or 6 on a 6-point Likert scale) as a measure of closeness between teachers and students. We then estimated a model by interacting the two teachers' violation indicators with each measure for each of the four questions, as well as with a summary measure of all four questions.

We start again with an analysis of the raw data. Figure 2 illustrates the proportion of disqualified exams due to teacher rule violations in the same exam code and school in the preceding year. The different panels further break the sample using the two indices of the students-teachers reciprocity relationship. The left panel utilizes the four-question index, while the right panel employs the eight-question index. The contrast in means of the samples above and below the 50 percent threshold of the two indices shows the same pattern as in Figure 1, based on the homogeneity indices: in communities with higher reciprocity between students and teachers, students cheat relatively less when teachers are willing to break rules in their favor.

Table 7 reports the respective regression results.[16] In columns 1-4, we present the estimated model, with each column corresponding to one of the four questions about the teacher-student

[16] Since we do not have GEMS survey data for a few communities, the sample is smaller compared to the sample used for the homogeneity measures in Tables 3-4 (85% of the original sample). The results in the

relationship. In column 5, we use the summary measure of the four GEMS questions. The results are consistent and align with the findings from the homogeneity measures. Communities with closer, more reciprocal teacher-student relations, as captured by each of the GEMS questions, also show a smaller (possibly negative) effect of positive teacher violations on the likelihood of students cheating.

In addition to the four questions above, we identified four other questions in the GEMS questionnaire that are somewhat related to the teacher-student relationship (see data section for details). We computed a summary index that includes these four items, as well as the other four listed in columns 1-4 in Table 7. The Pearson correlation coefficient between the two indices is 0.958 (see column 10 in the online appendix, Table A2); therefore, we expect a similar result with this expanded index. Column 6 of Table 7 presents results based on the eight-item summary index, and they are very similar to those in Column 5.

The evidence in Table 7 aligns with the results regarding the interaction between teachers' rule violations and students' cheating in exams, as presented in Tables 3-5. This is an expected result, given the large positive correlation between each homogeneity measure and each GEMS question or its summary indices. We report these correlations in the online appendix Table A2. For example, the correlation between the summary index of the four items and the zip code HHI is 0.557. The correlation coefficients with each of the four items range from 0.426 to 0.552. The respective correlation with the summary index of the eight items is 0.519. The correlations of the two GEMS items' summary indices and the school family name HHI are 0.546 and 0.537, respectively. These high correlations suggest that the homogeneity measures and the GEMS items share sources of influence on the extent of teachers-students reciprocity. Whether one is a mechanism for the other's effect is a link we cannot disentangle with the data we have.

smaller sample with respect to the homogeneity measures, which are presented in online appendix Tables A5 and A6, are, however, very similar to those obtained from the full sample in Table 4, suggesting that there is no sample selection difference. Results are qualitatively similar using the continuous measure of rule violations (Appendix Table B5).

7. Conclusions

This paper examines the transmission of rule-breaking from teachers to students in educational settings, revealing nuanced patterns that depend on both the nature of teacher rule violations and community structure. Exploiting within-student variation in exposure to different teachers, we find robust evidence that teachers' grading improprieties significantly affect student ethical behavior, but in ways that challenge simple models of moral contagion.

When teachers break the rules in ways that harm students—specifically, giving systematically lower internal grades than warranted—students consistently respond by cheating more in high-stakes matriculation exams. This finding holds across diverse community structures, supporting behavioral models in which individuals either imitate the unethical conduct of authority figures or retaliate against perceived unfairness.

However, when teachers break rules to benefit students by inflating internal grades, student responses vary systematically with community structure. In heterogeneous communities, such favorable rule violations still increase student cheating, though to a lesser extent than violations that harm students. In contrast, in homogeneous, tight-knit communities and schools, students respond to teacher leniency by cheating significantly less. This pattern is robust across multiple measures of community and school homogeneity, including surname concentration, residential clustering by zip code, and concentration of feeder elementary schools. This suggests that in close-knit social structures, reciprocal norms can dominate imitation effects, leading students to respond to favorable treatment with more ethical conduct.

Our data allows us to rule out several alternative explanations for these patterns. The results are robust to controlling for prior sanctions imposed on schools and for students' internal grades, suggesting that the observed effects operate through the ethical environment established by teachers rather than through strategic responses to expected sanctions or grade incentives.

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