Inter-Ethnic Friendship and Hostility in Hungarian Schools: The Role of Academic Achievement and Exposure

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Social relevance, motivation & contribution
Preview of main results
Data and methods
Questions:

1. Does the “acting white” mechanism exist in Hungarian schools?
2. How can inter-ethnic friendships be encouraged?
3. Using these policy instruments, what kind of consequences can we expect? Back-of-the-envelope national estimates

Conclusion and further research
Social Relevance: Social Cohesion

- Close contact with members of a disadvantaged minority decreases prejudice against the minority
  - People from the majority are less prejudiced against the minority if they are connected to people from the minority
  - Meta-analysis of Pettigrew and Tropp (2006, 2011) using 500 studies from 700 samples shows average correlation of $-0.21$ between number of intergroup contacts and prejudice
    - average effect size is somewhat larger ($-0.34$) in studies with exogenous variation in contact (experimental design, no self selection)

- Most of these studies analyze potential contact ("acquaintances")
  - Broader than friendship (2. generation studies: friendship)

- Does closeness of the contact matter?
  - Intuitively it should: closer contacts should lead to higher levels of tolerance
Two examples supporting the role of very close contacts

Very close contact with members of a disadvantaged minority increases support for policies that benefit disadvantaged minorities

▶ Boisjoly, Duncan, Kremer, Levy and Eccles (2006) find that white students who are randomly assigned to African American roommates are significantly more likely to endorse affirmative action

In the Hungarian Life Course Survey (TARKI) of adolescents non-Roma respondents with Roma friends scored lower by 0.4 std. on a standardized scale of prejudice against the Roma

▶ ethnicity measured as a combination of interviewer classification (in one wave), identification of biological parents (in two waves) and identification of the adolescents themselves (in four waves)

▶ association is similar among boys and girls
Contact with the members of the majority may lead to better choices and better integration of members of a disadvantaged minority

Theories of Social Capital (Loury, 1977) and Weak Ties (Granovetter, 1973)

- most important examples are choosing schools and finding jobs
- Crain (1992) finds that black students who were randomly assigned opportunity to attend middle-class schools had better outcomes and more white friends sixteen years later

Does closeness of contact matter?
- Literature inconclusive
Motivation: Inter-Ethnic Friendships Matter

Our starting point:

- Non-Roma students with Roma friends are expected to become more tolerant than non-Roma students who simply have Roma classmates.

How can inter-ethnic friendships be encouraged?

1. Being exposed to classmates of different ethnicity (necessary condition)
   - and having equal status

2. Sharing common goals, common interest with them

Higher achievement in school *may be* an important common goal.
Higher achievement is not necessarily a common goal

- The potential problem of “acting white”
  - Academically inclined and better performing members of a minority may be shunned by their peers
  - Negative incentive for them to work for higher achievement
  - Can undermine achievement as a common goal that can foster inter-ethnic friendships

- Fryer and Torelli (2010): Black and Hispanic HS. students with high GPA have fewer friends from their own minority group than similar students with lower GPA
  - And this is not compensated by having more friends from the majority
  - Resulting in fewer friends altogether

- Fryer and Torelli emphasize results on “popularity”
  - Number of friends weighted by how many friends they have, iterated
  - But their result is the same if they simply look at the number of friends
“Acting White”: adverse effects, US

Fryer and Torelli (2010): popularity of high school students and their GPA
Our Contribution

- We analyze the association of inter-ethnic contacts with GPA in Hungarian schools
  - Roma students and non-Roma students
  - Our data covers primary school students in grade 8
    - relatively small classes (average class size is 25)
    - typical student spent 8 years with same classmates by the time of our measurement of friendship

- We measure hostility as well as friendship
  - No study looked hostility in relation with GPA
    - in part because the Add Health data (analyzed by Fryer and Torelli and many others) does not contain measures on hostility

- We look at the interaction of GPA and ethnic composition in associations with contacts

- We carry out a simple simulation exercise to assess the nation-wide benefits to higher achievement and more equal distribution of Roma students across classes
Our evidence does not support the existence of “Acting White”
  ▶ On the contrary: Roma students with better results have more friends and fewer refusals. Incentives work in the right direction
    ★ in the same way as non-Roma students with better results have more friends and fewer refusals

Higher exposure of Roma students to non-Roma classmates increases inter-ethnic friendships more than it increases inter-ethnic refusals
  ▶ the driving force is interethnic contacts of high-GPA Roma students

Higher exposure of Roma students to non-Roma classmates benefits high-GPA Roma students
  ▶ in terms of the composition of their friendships
  ▶ but hurts low-GPA Roma students by decreasing their overall number of friends and by increasing their overall number of refusals

Policies that combine more equal distribution of Roma students and raise the achievement of Roma are likely to produce higher social cohesion
  ▶ than policies that aim at one of the two only
Data
Sample

- 8th-grade students
- Primary schools in 74 of the larger municipalities in Hungary
  - Except Budapest
  - Fraction Roma in classes between 10 percent and 90 percent
- 82 schools
  - 164 classes
  - 3213 students (637 Roma, 2569 non-Roma, 7 unknown)
- Fieldwork: Spring 2010
- Classes are dropped if fewer than 10 students or more than 25 percent missing
- Questionnaire about friendship and refusal nominations
Data
Measuring friendship network

- Questions about friendship and refusals
  - Format comparable to the Add Health survey in the U.S.
    - but refusals included, too
  - Names of friends entered, converted to identifiers, and linked to classmates
    - linking ethnic identity and all personal information as well
- Five best male friends
- Five best female friends
- Refusals
  - List those classmates of yours (max 5) that you would not sit next to on a train
- Additional questions on friends outside the class and school as well as neighbors
  - list up to two for each
  - information on those individuals are also collected
Data
Other variables

- Survey included additional questions on grades and family background
- Ethnicity
  - 2 questions asked to allow for dual identity
    - “In our country, people belong to different minorities and ethnic groups. To what ethnic group do you consider yourself to primarily belong?”
    - “To what ethnic group do you consider yourself to belong secondarily?”
- GPA in grade 8
  - Linked from class records
  - Maximum GPA 5; minimum passing GPA 2
  - Created “High GPA” category: GPA between 3.5 and 5
- Test scores in grades 8 and 10
  - From administrative records (NABC)
The IEF students have lower achievement and less educated parents than the national average.

IEF vs. NABC

- Table shows standardized test scores and parental education
- In the IEF survey
- and the National Assessment of Basic Competences

* same grade, same year, admin survey

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<thead>
<tr>
<th></th>
<th>IEF</th>
<th>NABC</th>
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<tbody>
<tr>
<td>Test scores</td>
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<tr>
<td>Math</td>
<td>-0.26</td>
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<td>Reading</td>
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<tr>
<td>Education level: primary or less</td>
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</tr>
<tr>
<td>Father</td>
<td>21%</td>
<td>14%</td>
</tr>
<tr>
<td>Mother</td>
<td>28%</td>
<td>18%</td>
</tr>
<tr>
<td>Fraction of Roma students</td>
<td>20%</td>
<td>14%</td>
</tr>
</tbody>
</table>
Fraction of Roma students

- Our sample over-represents classes with higher fraction of Roma students (mean=0.21)
GPA By Ethnicity

- Average GPA 3.8 among non-Roma; 2.9 among Roma
Fraction of Roma students in class and GPA

- Fraction of Roma not related to GPA among Roma but weakly negatively related to GPA among non-Roma
Fraction of Roma students in class and test scores

- Fraction of Roma weakly negatively related to test scores among Roma and strongly negatively related to test scores among non-Roma.
Methods

- Number of friends (refusals): the number of same-sex classmates nominating the individual as friend (refusing her/him)
  - “Indegree”
  - Net nominations = friendship nominations - refusals

- We constrain contacts to same-sex friendship nominations and refusals
  - Standard in literature; excluding intimate relationships

- We show graphs first
  - Separately for Roma and non-Roma

- Then we show linear regressions
  - Separately for Roma and non-Roma
  - We control for many variables of the individual and the class
  - We also include class FE, sometimes classXgender FE

- Do not interpret Roma vs non-Roma magnitudes for now
  - Magnitudes depend on the size of the group
  - Will be analyzed in next section
## Friendships and refusals

### Summary statistics

#### Number of friends and refusals

<table>
<thead>
<tr>
<th></th>
<th>Indegree</th>
<th>Roma</th>
<th>non-Roma</th>
<th>Gap</th>
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<td><strong>Friendships</strong></td>
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<tr>
<td>with Roma</td>
<td>1.7</td>
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<td><strong>Refusals</strong></td>
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<tr>
<td>by Roma</td>
<td>0.2</td>
<td>0.2</td>
<td>0.0</td>
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<tr>
<td>by non-Roma</td>
<td>1.1</td>
<td>0.8</td>
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<table>
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<tr>
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<td><strong>Friendships</strong></td>
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<tr>
<td>with Roma</td>
<td>1.7</td>
<td>0.4</td>
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<tr>
<td>with non-Roma</td>
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<td>3.5</td>
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<td><strong>Refusals</strong></td>
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<tr>
<td>toward Roma</td>
<td>0.2</td>
<td>0.3</td>
<td>-0.1</td>
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<tr>
<td>toward non-Roma</td>
<td>0.7</td>
<td>0.8</td>
<td>-0.1</td>
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</table>
1. QUESTION:

DOES THE “ACTING WHITE” MECHANISM EXIST IN HUNGARIAN SCHOOLS?
All friends and GPA

- Students with higher GPA have more friends
  - Relationship very similar for Roma and non-Roma

![Graph showing the relationship between GPA and the number of same-sex friends for Roma and non-Roma students. The graph indicates a positive correlation between GPA and the number of friends for both groups, with the lines for Roma and non-Roma students overlapping.](image)
Non-Roma friends and GPA

- Students with higher GPA have more non-Roma friends
  - Relationship very similar for Roma and non-Roma (slopes)
  - Homophily seems strong but is overestimated; see later
Roma friends and GPA

- Roma students with higher GPA do not have fewer Roma friends
- Non-Roma students with higher GPA have slightly fewer Roma friends
  - Very weak relationships
  - Homophily seems strong but is overestimated; see later
Friends of Roma students and GPA

- Results are robust to the inclusion of control variables and fixed-effects

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<th>(5)</th>
<th>(6)</th>
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<tbody>
<tr>
<td># of Roma friends</td>
<td>0.056 (0.085)</td>
<td>0.067 (0.107)</td>
<td>0.172 (0.117)</td>
<td>0.673*** (0.104)</td>
<td>0.622*** (0.156)</td>
<td>0.511*** (0.177)</td>
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<td>Average grade (GPA)</td>
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<td>Class-gender group fixed effects</td>
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<tr>
<td>Adjusted R^2</td>
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</tbody>
</table>

Dependent variable: Number of friends (indegree)
Robust standard errors adjusted for clustering by class are in parentheses
Controls: age, gender, number of skipped classes with permission, education level of mother/father, living together with mother/father, mother/father employed in regular job, parenting, years in kindergarten, financial hardship, household size, Roma neighbours, non-Roma neighbours, composition of neighbourhood, number of same-sex students with good grades & filled out questionnaire
Dummies are included for missing regressors
* p < 0.10, ** p < 0.05, *** p < 0.01
Friends of Roma students and test scores

- Results are similar for test scores

<table>
<thead>
<tr>
<th></th>
<th>(1) # of Roma friends</th>
<th>(2) # of Roma friends</th>
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<th>(6) # of non-Roma friends</th>
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<tbody>
<tr>
<td>Test score</td>
<td>-0.175 (0.106)</td>
<td>-0.032 (0.108)</td>
<td>0.136 (0.120)</td>
<td>0.485*** (0.108)</td>
<td>0.326** (0.160)</td>
<td>0.225 (0.152)</td>
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<td>Class-gender group</td>
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<tr>
<td>Adjusted R²</td>
<td>0.007</td>
<td>0.400</td>
<td>0.500</td>
<td>0.049</td>
<td>0.315</td>
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Dummies are included for missing regressors
* p < 0.10, ** p < 0.05, *** p < 0.01
Friends of Roma students and behavior grade

- Results are similar for behavior grade

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<th>(1) # of Roma friends</th>
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<th>(5) # of non-Roma friends</th>
<th>(6) # of non-Roma friends</th>
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<tbody>
<tr>
<td>Behavior grade</td>
<td>-0.027</td>
<td>-0.037</td>
<td>-0.044</td>
<td>0.353***</td>
<td>0.302***</td>
<td>0.286**</td>
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<td></td>
<td>(0.069)</td>
<td>(0.093)</td>
<td>(0.128)</td>
<td>(0.066)</td>
<td>(0.108)</td>
<td>(0.126)</td>
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<td>Adjusted R²</td>
<td>-0.001</td>
<td>0.400</td>
<td>0.498</td>
<td>0.041</td>
<td>0.319</td>
<td>0.486</td>
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Dependent variable: Number of friends (indegree)
Robust standard errors adjusted for clustering by class are in parentheses
Controls: age, gender, number of skipped classes with permission, education level of mother/father, living together with mother/father, mother/father employed in regular job, parenting, years in kindergarten, financial hardship, household size, Roma neighbours, non-Roma neighbours, composition of neighbourhood, number of same-sex students with good grades & filled out questionnaire
Dummies are included for missing regressors
* p < 0.10, ** p < 0.05, *** p < 0.01
Further robustness checks

- Results are the same if LHS variable is replaced by some kind of popularity measure
  - One-step popularity: weighting one’s friends by the number of the friends of one’s friends
  - The index of popularity introduced by Fryer and Torelli
    - when number of one’s friends friends, the number of their friends etc. are taken into account as well, in an iterated fashion

- If we include GPA, test scores and behavior grade together in the regressions GPA remains strongest
  - Achievement matters more than behavior
  - GPA is more salient than test score
All refusals and GPA

- Students with higher GPA have fewer refusals
  - Relationship similar for Roma and non-Roma
Refusals by non-Roma and GPA

- Students with higher GPA are less often refused by non-Roma
  - Relationship similar for Roma and non-Roma
Refusals by Roma and GPA

- Students with higher GPA have the same number of Roma refusals
  - Relationship similar for Roma and non-Roma
Refusals of Roma students and GPA

- Results are similar (sometimes stronger) when controlling for covariates and fixed-effects

<table>
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<tr>
<th></th>
<th>(1) # of refusals by Roma</th>
<th>(2) # of refusals by Roma</th>
<th>(3) # of refusals by Roma</th>
<th>(4) # of refusals by non-Roma</th>
<th>(5) # of refusals by non-Roma</th>
<th>(6) # of refusals by non-Roma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average grade (GPA)</td>
<td>-0.030 ( (0.038) )</td>
<td>-0.158 ( ** ) ( (0.056) )</td>
<td>-0.121 * ( (0.072) )</td>
<td>-0.558 ** ( (0.106) )</td>
<td>-0.568 *** ( (0.134) )</td>
<td>-0.370 ** ( (0.148) )</td>
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<tr>
<td>Class-gender group</td>
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<tr>
<td>Adjusted R^2</td>
<td>-0.002</td>
<td>0.063</td>
<td>0.061</td>
<td>0.053</td>
<td>0.324</td>
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</table>

Dependent variable: Number of refusals (indegree)
Robust standard errors adjusted for clustering by class are in parentheses
Controls: age, gender, number of skipped classes with permission, education level of mother/father, living together with mother/father, mother/father employed in regular job, parenting, years in kindergarten, financial hardship, household size, Roma neighbours, non-Roma neighbours, composition of neighbourhood, number of same-sex students with good grades & filled out questionnaire
Dummies are included for missing regressors
* p < 0.10, ** p < 0.05, *** p < 0.01
“Net” relationships and GPA

- Students with higher GPA have more “net” relationships
  - Relationship similar for Roma and non-Roma
“Net” relationship to non-Roma students and GPA

- “Net” relationships to non-Roma strongly positively related to GPA
  - Very similar for Roma and non-Roma
“Net” relationship to Roma students and GPA

- “Net” relationships to Roma students are not related to GPA
  - Relationship similar for Roma and non-Roma

![Graph showing Roma relationships](image-url)
Results are similar (sometimes stronger) when controlling for covariates and fixed-effects

<table>
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<tr>
<th></th>
<th>(1) # of “net” relationships to Roma</th>
<th>(2) # of “net” relationships to Roma</th>
<th>(3) # of “net” relationships to Roma</th>
<th>(4) # of “net” relationships to non-Roma</th>
<th>(5) # of “net” relationships to non-Roma</th>
<th>(6) # of “net” relationships to non-Roma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average grade (GPA)</td>
<td>0.086 (0.099)</td>
<td>0.225 (0.141)</td>
<td>0.292* (0.153)</td>
<td>1.231 *** (0.158)</td>
<td>1.191 *** (0.246)</td>
<td>0.881 *** (0.257)</td>
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<td>Class fixed effects</td>
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<tr>
<td>Class-gender group fixed effects</td>
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<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.007</td>
<td>0.257</td>
<td>0.295</td>
<td>0.115</td>
<td>0.342</td>
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<td>637</td>
<td>637</td>
<td>637</td>
<td>637</td>
</tr>
</tbody>
</table>

Dependent variable: Number of friendships - refusals (indegree)
Robust standard errors adjusted for clustering by class are in parentheses
Controls: age, gender, number of skipped classes with permission, education level of mother/father, living together with mother/father, mother/father employed in regular job, parenting, years in kindergarten, financial hardship, household size, Roma neighbours, non-Roma neighbours, composition of neighbourhood, number of same-sex students with good grades & filled out questionnaire
Dummies are included for missing regressors

*p < 0.10, **p < 0.05, ***p < 0.01
Summary of the results
Relationship of GPA and friendship nominations and refusals

<table>
<thead>
<tr>
<th></th>
<th>Nominations by non-Roma</th>
<th>Nominations by Roma</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Friendships</td>
<td>Refusals</td>
</tr>
<tr>
<td>Roma</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>non-Roma</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

+: increasing with GPA
-: decreasing with GPA
0: independent from GPA

- Friendship nominations by non-Roma are positively related to GPA
  - refusals by non-Roma are negatively related to GPA
  - similar toward Roma and non-Roma classmates, no ethnic bias

- Friendship nominations and refusals by Roma are not related to GPA
  - similar toward Roma and non-Roma classmates, no ethnic bias

- No evidence for negative effects of “acting white”
2. QUESTION:

HOW CAN INTER-ETHNIC FRIENDSHIPS BE ENCOURAGED?

Role of exposure

Role of school achievement
Inter-ethnic friendships and hostility and exposure to the other ethnic group

- We show graphs for the number of friendship nominations and refusals as a function of the fraction of Roma students (“exposure”) in class
  - Recall the distribution of the ethnic composition in our sample: most classes between 10% Roma and 50% Roma

- We show results for students with high GPA and low GPA separately
  - High GPA: at least 3.5
    - 23% of Roma; 64% of non-Roma
  - Low GPA: below 3.5
    - 77% of Roma; 36% of non-Roma

- Recall (slide 17) that the fraction of Roma students in the class is not related to the fraction of high-GPA students among the Roma students
  - but it is negatively related to the fraction of high-GPA students among the non-Roma students
Friendship nominations by non-Roma
Friendship nominations of high-GPA Roma and non-Roma students by non-Roma classmates
Refusals by non-Roma
Refusals of high-GPA Roma and non-Roma students by non-Roma classmates
Friendship nominations by non-Roma

Friendship nominations of low-GPA Roma and non-Roma students by non-Roma classmates
Refusals by non-Roma

Refusals of low-GPA Roma and non-Roma students by non-Roma classmates
Friendship nominations and refusals by non-Roma
Summary of results for high-GPA Roma and non-Roma students

- High-GPA Roma students have substantially more non-Roma friends in classes with few Roma students than in classes with many Roma students
  - They also have somewhat more non-Roma refusals
- The relationship is similar to friendship nominations and refusals of high-GPA non-Roma students by non-Roma classmates
- Not only the slopes but the levels are also similar
  - except around .3 and .4
    ★ but confidence intervals are wide
- Interpretation: High-GPA Roma students are treated the same way by their non-Roma classmates as high-GPA non-Roma students
Friendship nominations and refusals by non-Roma
Summary of results for low-GPA Roma and non-Roma students

- Low-GPA Roma students have more non-Roma friends in classes with few Roma students than in classes with many Roma students
  - But this relationship is weaker than friendship nominations of low-GPA non-Roma students by non-Roma classmates
  - So low-GPA Roma students have fewer non-Roma friends than their non-Roma peers when fraction Roma is low

- Low-GPA Roma students have more non-Roma refusals in classes with few Roma students than in classes with many Roma students
  - And this relationship is stronger than refusals of low-GPA non-Roma students by non-Roma classmates
  - So low-GPA Roma students have more non-Roma refusals than their non-Roma peers when fraction Roma is low

- Interpretation: Low-GPA Roma students are befriended less and refused more by their non-Roma classmates as low-GPA non-Roma students
Friendship nominations by Roma

Friendship nominations of high-GPA Roma and low-GPA Roma students by Roma classmates

Roma friendships

Number of same-sex relationships (indegree) vs. Fraction of Roma in class-gender group

- 95% CI
- High-GPA Roma
- Low-GPA Roma

Hajdu - Kertesi - Kézdi
Inter-ethnic friendship and hostility
CEU-IAS Seminar
Refusals by Roma

Refusals of high-GPA Roma and low-GPA Roma students by Roma classmates

![Graph showing refusals by Roma students]
Friendship nominations and refusals by Roma

Friendship nominations and refusals of Roma students by Roma classmates

- There is no significant difference between high-GPA Roma students and low-GPA Roma students in how they are nominated as friends or refused by their Roma classmates
  - No difference in levels
  - No difference in the relationships with the fraction of Roma students in class
- Roma-Roma refusals are very rare even if exposure to Roma classmates is high
Friendship nominations and refusals overall

Friendship nominations and refusals of high-GPA Roma students

![Graph showing the number of same-sex relationships (indegree) on the y-axis against the fraction of Roma in the class-gender group on the x-axis. The graph includes lines for friendships and refusals with 95% confidence intervals.](image-url)
Friendship nominations and refusals overall
Friendship nominations and refusals of low-GPA Roma students

![Graph showing friendship nominations and refusals of low-GPA Roma students](image)

- **ROMA - LOW GPA**
  - All relationships

- **Y-axis**: Number of same-sex relationships (indegree)
  - 95% CI
  - Friendships
  - 95% CI
  - Refusals

- **X-axis**: Fraction of Roma in class-gender group
  - 0.1 to 0.8
Robustness of Results on Friendships of Roma

- All results hold conditional on covariates

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># of all friends</td>
<td># of all friends</td>
<td># of all friends</td>
<td># of Roma friends</td>
<td># of Roma friends</td>
<td># of Roma friends</td>
<td># of Non-Roma friends</td>
<td># of Non-Roma friends</td>
<td># of Non-Roma friends</td>
</tr>
<tr>
<td>Fraction of Roma same-sex classmates</td>
<td>0.257 (0.594)</td>
<td>-0.185 (0.564)</td>
<td>0.274 (1.113)</td>
<td>3.636***</td>
<td>3.628***</td>
<td>4.726***</td>
<td>-3.378***</td>
<td>-3.813***</td>
<td>-4.451***</td>
</tr>
<tr>
<td>Fraction of Roma same-sex classmates * Low GPA</td>
<td>1.203*** (0.489)</td>
<td>1.230*** (0.461)</td>
<td>0.961* (0.545)</td>
<td>0.188 (0.308)</td>
<td>0.348 (0.329)</td>
<td>0.243 (0.380)</td>
<td>1.014*** (0.297)</td>
<td>0.881*** (0.284)</td>
<td>0.718** (0.361)</td>
</tr>
<tr>
<td>Number of same-sex classmates</td>
<td>0.102*** (0.027)</td>
<td>0.163*** (0.029)</td>
<td>0.186*** (0.049)</td>
<td>0.141*** (0.022)</td>
<td>0.143*** (0.031)</td>
<td>0.148*** (0.032)</td>
<td>-0.040 (0.029)</td>
<td>0.020 (0.027)</td>
<td>0.038 (0.043)</td>
</tr>
<tr>
<td>Average grade (GPA)</td>
<td>0.961*** (0.137)</td>
<td>0.927*** (0.151)</td>
<td>0.981*** (0.213)</td>
<td>0.073 (0.081)</td>
<td>0.086 (0.074)</td>
<td>0.160 (0.101)</td>
<td>0.888*** (0.120)</td>
<td>0.842*** (0.139)</td>
<td>0.821*** (0.188)</td>
</tr>
</tbody>
</table>

Controls: Number of friendships (indegree)

Class fixed effects: yes

Adjusted R²: 0.120 (629) 0.198 (629) 0.269 (629) 0.404 (629) 0.439 (629) 0.521 (629) 0.224 (629) 0.298 (629) 0.391 (629)

p-value of the effect of Roma classmates for Low GPA students: 0.000 (0.011) 0.229 (0.000) 0.000 (0.000) 0.000 (0.000) 0.000 (0.000) 0.000 (0.000) 0.000 (0.000) 0.000 (0.000) 0.000 (0.000)

Dependent variable: Number of friendships (indegree)

Robust standard errors adjusted for clustering by class are in parentheses

Controls: age, gender, number of skipped classes with permission, education level of mother/father, living together with mother/father, mother/father employed in regular job, parenting, years in kindergarten, financial hardship, household size, Roma neighbours, Non-Roma neighbours, composition of neighbourhood, number of same-sex students with good grades & filled out questionnaire

Dummies are included for missing regressors

*p < 0.10, **p < 0.05, ***p < 0.01
Friendship nominations and refusals of Roma students
Summary of results for high-GPA and low-GPA Roma

- Number of friends of Roma students with **high GPA** is not related to the ethnic composition of their class
  - Refusals are not related to ethnic composition, either
  - In classes where fraction of Roma is low the decrease in the number of Roma friendships is fully compensated by the increase of non-Roma friendships

- Number of friends of Roma students with **low GPA** is inversely related to the fraction of non-Roma students in their class
  - Refusals are also inversely related to the fraction of non-Roma students
  - In classes with fewer Roma students, they have fewer Roma friends (due to fewer opportunities to have Roma friends)
    - and they do not have enough extra non-Roma friends to compensate for this (despite more opportunities)
**Inter-Ethnic Difference In Relationships**

- Difference between Roma and non-Roma students in the number of their non-Roma relationships

<table>
<thead>
<tr>
<th></th>
<th>Friendships with non-Roma</th>
<th>Refusals by non-Roma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw gap</td>
<td>-1.8</td>
<td>+0.3</td>
</tr>
<tr>
<td>Explained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA</td>
<td>-0.5</td>
<td>+0.3</td>
</tr>
<tr>
<td>Exposure</td>
<td>-0.85</td>
<td>-0.4</td>
</tr>
<tr>
<td>Unexplained</td>
<td>-0.45</td>
<td>+0.4</td>
</tr>
</tbody>
</table>
3. QUESTION:

USING THESE POLICY INSTRUMENTS, WHAT KIND OF CONSEQUENCES CAN WE EXPECT?

Back-of-the-envelope national estimates
Simple Welfare Analysis

- Take our estimates as causal effects of exposure
  - Estimate the “effect” of the fraction of Roma students in class on the probability of non-Roma students nominating at least one Roma friend / refusing at least one Roma classmate
    - linear probability models, fraction of Roma students on the RHS entered as spline
    - other RHS variables include fraction of high-GPA students among the Roma students and other control variables

- What would happen to the number of non-Roma friends of Roma students if fraction of Roma students were different? (using NABC admin data)
  - Start from existing distribution of fraction of Roma students in class
    - estimated from data on their fraction in school, with additional assumptions
  - Predict number of non-Roma students who nominate at least one Roma student as their friend
  - Then re-do the exercise assuming different fraction of Roma in each class
Simple Welfare Analysis

- **Experiment:** increase inter-ethnic exposure to its theoretical maximum
  - and keep level of GPA constant

- **Outcomes of interest:** number of non-Roma students who
  - have a Roma friend (at least one)
  - don’t have Roma friend
  - refuse a Roma classmate (at least one)
  - do not refuse any Roma classmate

<table>
<thead>
<tr>
<th></th>
<th>Lower bound</th>
<th>Upper bound</th>
<th>Equal distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has a Roma friend</td>
<td>12,200</td>
<td>20,300</td>
<td>28,300</td>
</tr>
<tr>
<td>Does not have a Roma friend</td>
<td>74,900</td>
<td>66,800</td>
<td>58,800</td>
</tr>
<tr>
<td>Refuses a Roma classmate</td>
<td>7,200</td>
<td>11,900</td>
<td>17,100</td>
</tr>
<tr>
<td>Does not refuse a Roma classmate</td>
<td>79,900</td>
<td>75,200</td>
<td>70,000</td>
</tr>
</tbody>
</table>
Simple Welfare Analysis

- Experiment: increase inter-ethnic exposure to its theoretical maximum and increase fraction of high-GPA students among the Roma students until the gap is closed

<table>
<thead>
<tr>
<th>Type of contact</th>
<th>Baseline estimation*</th>
<th>Achievement gap closed**</th>
<th>Equal distribution***</th>
<th>Both instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friendship (F)</td>
<td>16</td>
<td>22</td>
<td>28</td>
<td>34</td>
</tr>
<tr>
<td>Refusal (R)</td>
<td>10</td>
<td>8</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>Net contact (N=F-R)</td>
<td>B=6</td>
<td>14</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>Additional net contact (Δ=N-B)</td>
<td>-</td>
<td>8</td>
<td>5</td>
<td>13</td>
</tr>
</tbody>
</table>

*National estimates. Scaling up IEF estimates using NABC data. Average of lower and upper bounds (slide 56)
**Eg. by targeted educational interventions
***Fraction of Roma students is the same in each class of the given microregion (járás)
Conclusions

- We analyzed the association of inter-ethnic contacts with GPA in Hungarian schools in 8th grade
  - Roma students and non-Roma students
  - We measured hostility as well as friendship
  - We looked at the interaction of GPA and ethnic composition in associations with contacts

- We found that Roma students with higher GPA are more popular and less refused than Roma students with lower GPA
  - No evidence for negative effects of “acting white”
  - On the contrary, if interpreted as causal relationships, substantial positive returns to better performance

- Higher exposure of Roma students to non-Roma classmates benefits high-GPA Roma students
  - in terms of the composition of their friendships
  - but hurts low-GPA Roma students by decreasing their overall number of friends and by increasing their overall number of refusals
Policies that aim at both
- increasing exposure (more equal distribution of Roma students)
- and raising Roma achievement at the same time

Are likely to produce substantially higher social cohesion
than policies that aim at one of the two only
Further research

- We carried out some simple welfare analysis
  - We plan to do more sophisticated simulations
- We plan to analyze the incentives for Roma to work harder
  - And the effect of such incentives if exposure to non-Roma students changes
- We plan to contrast our results to those in the U.S.
  - analyzing the Add Health data ourselves