Be the Smart Guy: The Role of Gender and Ethnicity in Ability Attribution Processes in the Classroom

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Abstract

Girls and members of certain minority groups are often evaluated as less competent than boys and majority students. We contrast two theoretical explanations for why this might happen. Double standards theory predicts that people use different standards for making inferences about others' abilities based on social status. Social identity processes, however, suggest that people evaluate in-group members more positively than out-group members. We analyse cross-sectional dyadic peer nomination data from 21 primary school classes in Hungary (N=392, M_{age}= 13 years). We use exponential random graph models and control for grades as we posit that ability attributions are dependent on peers' opinions and teachers' public evaluations. Our findings are mostly in line with social identity theory: students are more likely to nominate in-group peers as clever compared to classmates from the out-group, in terms of both gender and ethnicity. Nonetheless, ethnic and gender bias in attributions differ in some important ways.

Keywords: ability attributions, social networks, ethnic classification, exponential random graph models, gender differences, Roma

Introduction

Boys and girls, as well as students of different racial and ethnic groups experience different expectations regarding their intellectual abilities in school. Different expectations are harmful origins of subtle discrimination (e.g., Abrams & Hogg, 1990). Widely shared stereotypes about women's lower abilities in the science, technology, engineering, and mathematics (STEM) disciplines (Cvencek, Meltzoff, & Greenwald, 2011; Steele, 1997), for instance, are hard obstacles of a more balanced female participation in higher education and in the labour market in STEM-related fields. Several studies suggest, moreover, that girls and women are not only considered less able than boys and men in STEM disciplines, but they are believed to have lower cognitive abilities in general (Furnham, Reeves, & Budhani, 2002; Kirkcaldy, Noack, Furnham, & Siefen, 2007; Storage, Horne, Cimpian, & Leslie, 2016). Girls as young as six might already share this belief: they are less likely than boys to consider members of their own gender to be really smart (Bian, Leslie, & Cimpian, 2017).

Certain ethnic and racial groups are targeted by similar or even more stigmatizing negative stereotypes about their cognitive abilities. African American and Hispanic students, for instance, often experience negative opinions about their intellectual skills (Fries-Britt & Griffin, 2007; McKown & Weinstein, 2003; Steele, 1997; Steele & Aronson, 1995). Such stereotypes exist and are widely shared about members of the Roma minority in Hungary, which is the focus of the current study (Bordács, 2001; Ligeti, 2006). Stereotypical differences have damaging consequences on equality and might lead to expectation-confirmation sequences (Darley & Fazio, 1980).

Women and members of disadvantaged minorities might be evaluated as less competent than men and members of the majority, even with the same level of

performance (Foschi, 2000; Grunspan et al., 2016). Double standards theory (Foschi, 1996, 2000) provides a possible explanation why. People use different standards for making inferences about others' competence based on their social status. Low status individuals such as women and members of minorities might be judged by a stricter standard than high status individuals due to status generalization processes.

Whereas double standard theory predicts that low status individuals have to perform better than high status individuals to be perceived as competent, social identity processes play a role in the differentiation of ability attributions within and between groups. Social identity theory (Tajfel, 1982; Tajfel & Turner, 1979) suggests that social groups try to establish a positive distinctiveness from other groups, and therefore, people evaluate in-group members more positively than out-group members. Given the contrasting predictions of these two theoretical perspectives (J. F. Dovidio, Gaertner, & Validzic, 1998), in the present study we aim to disentangle the effects of status generalization and social identity processes.

Our study moves beyond previous research in three major ways. First, we control for teachers' evaluations by including students' grade point averages (GPA) in the analysis. Therefore, we examine whether students attribute different levels of abilities to members of lower and higher status groups given the same level of academic performance. In Hungarian schools, students usually are aware of their classmates' grades. Hence, we can assume that grades serve as important signals about peers' abilities.

Second, we consider that ability attributions are interdependent with the ability attributions by peers. Developmental theories and empirical findings suggest that as adolescents get older, their social environment exerts stronger influence on their stereotypes and prejudicial attitudes (Aboud, 2005; Bar-Tal & Teichman, 2005; Raabe

& Beelmann, 2011), and in these years, peers' opinions become especially important for them (Hartup, 1993). Among others, ability attribution processes are also interdependent in multiple ways. In school, classmates and friends among them in particular are the relevant peers. For instance, students might learn the same opinion about the abilities of classmates from each other (Váradi, 2014); they might reciprocate favourable or unfavourable attributions; or simply might follow the crowd and adjust their ability attributions to that of the majority in the classroom. For these reasons of non-independence, we follow Grow, Takacs & Pal (2016) and model ability attributions as social network processes with the use of exponential random graph models (ERGMs, Lusher, Koskinen, & Robbins, 2013; Robins, Pattison, Kalish, & Lusher, 2007). ERGMs allow us to investigate the effects of gender and ethnicity on ability attributions, and control for interdependencies between students' perceptions.

Third, we use a novel way of measuring ethnicity. More in line with the social psychological and sociological view on identity, we consider those Roma, who are considered Roma by the classmates. More precisely, as we have information from every respondent about the perceived ethnicity of all classmates, we rely in our analysis on the directed network of ethnic nominations. We believe that our novel measurement brings us closer to the understanding of social processes in which labels by peers are more important than self-declared and often not disclosed identities. In fact, ethnic self-identification and perceptions of ethnicity by others often differ from each other (Boda & Néray, 2015; Messing, 2014; Telles & Lim, 1998). We argue that analysing students' perceptions about their classmates' ethnicity in relation with their perceptions about these classmates' abilities can provide us with further insights into ability attributions among ethnic groups.

Double standards in evaluation

Status characteristics theory (Berger, Cohen, & Zelditch, 1972), developed in the framework of expectation states theory (Berger, Conner, & Fisek, 1974; Correll & Ridgeway, 2006; Ridgeway, 1991) offers an explanation for why women and members of certain ethnic and racial groups are seen as less competent, get fewer opportunities to participate and are less influential in the decision making processes in task groups. Racial, ethnic, and gender categories are diffuse characteristics that carry different status values in most societies, and certain states of these categories (e.g., men, whites) are evaluated more positively than the others. Through the process of status generalization people form performance expectations based on these diffuse characteristics assuming that group members belonging to the higher-valued categories will perform better in solving the task (Correll & Ridgeway, 2006; Ridgeway, 1991).

Double standards theory (Foschi, 1996, 2000) extends status characteristics theory by providing a theoretical explanation for the phenomenon that lower status individuals are considered less competent than higher status individuals even if they achieve the same level of performance. The theory argues that different performance expectations towards low and high status individuals activate the use of different standards for making inferences about their competence. Low status individuals are therefore judged by a stricter standard than high status individuals and have to provide better performance in order to receive the same level of ability attributions. Experimental evidence suggests that women and low status ethnic and racial minorities are indeed less likely to be considered competent than members of more valued groups (for a review see Foschi, 2000).

Status characteristics theory and double standards theory were developed to provide theoretical frameworks for the emergence of status-related performance

expectations and ability attributions in collectively oriented task groups. Empirical evidence suggests, however, that status generalization processes occur in other types of settings such as schools and universities as well (Alexander, Entwisle, & Thompson, 1987; Cohen, 1982; Cohen & Lotan, 1995; Correll & Ridgeway, 2006). Correll (2001) has found, for instance, that male high school students rated their own mathematical ability higher than female students, even after controlling for grades and test scores. Grunspan et al. (2016) have shown that controlling for performance measured by grades, male undergraduate biology students tended to underestimate the academic performance of their female peers. Furthermore, Roma secondary school students in Hungary were shown to be less likely to be nominated as clever by their classmates than non-Roma Hungarian students (Grow et al., 2016).

Correll and Ridgeway (2001) have emphasized that status generalization processes might occur in every situation where individuals receive socially important and valid comparative performance evaluations. Grading in schools represents such an evaluation: grades are important determinants of educational advancement and provide the opportunity for making comparisons between students. Based on double standards theory we thus expect that (1) *controlling for grades, girls are less likely than boys to be considered clever by their classmates (Hypothesis 1a)*; and (2) *controlling for grades, Roma students are less likely than non-Roma students to be considered clever by their classmates (Hypothesis 1b).*

Foschi et al. (1994) have argued, however, that the perceivers' own level of the relevant status characteristic (e.g., whether the perceiver is male or female) might also affect the formation of performance expectations towards others. They have provided experimental evidence that male but not female participants exhibited a double standard based on gender. Male participants considered male job applicants with slightly better

academic records as more competent than female applicants. If the female applicant was the better performer, however, male participants did not considered her as more competent than male candidates. Female participants did not show such a bias. Grunspan et al. (2016) have found similar results by showing that male but not female students underestimated the academic performance of female biology students. It might occur thus that (1) *controlling for grades, girls are less likely than boys to devaluate their female peers' competence (Hypothesis 2a)*; and (2) *controlling for grades, Roma students are less likely than non-Roma students to devaluate their Roma peers' competence (Hypothesis 2b).* In other words, it is expected that female and Roma students are more likely than male and non-Roma students to nominate female and Roma peers as clever, respectively.

In-group favouritism in the evaluation of performance

In contrast to double standards theory, which predicts that high status individuals are considered more competent, social identity theory (Tajfel, 1982; Tajfel & Turner, 1979) suggests that students attribute higher competence to their in-group members then to out-group members. Social identity theory argues that individuals categorize people along several dimensions, make comparisons between these categories and are motivated to attach to positively valued groups in order to achieve a positive self-concept or high self-esteem (Abrams & Hogg, 2010). Individuals try to distance themselves from less desired memberships, but if they are classified into a category, they attempt to positively redefine in-group attributes, and establish a positive distinctiveness from other social groups by evaluating in-group members more positively (Tajfel, 1982; Tajfel & Turner, 1979). Gender and ethnicity are salient dimensions along which people differentiate themselves (e.g., Boda & Néray, 2015; McPherson, Smith-Lovin, & Cook, 2001) that have already become salient by pre-

adolescent age (Rivas-Drake, Umaña-Taylor, Schaefer, & Medina, 2017).

Based on findings of stereotype content research (Fiske, Cuddy, & Glick, 2007; Fiske, Cuddy, Glick, & Xu, 2002) it has been suggested that different social groups show in-group favouritism in different domains, especially if status relations are legitimate and stable (Grow, 2016; Oldmeadow & Fiske, 2010). In such contexts, high-status groups pursue positive distinctiveness in status-relevant domains such as competence, while low-status groups show in-group favouritism in domains related to warmth. If status differences are unstable and permeable such as during the American civil rights movements and feminist movements, however, low-status groups might also strive to be evaluated positively in the competence domain (Oldmeadow & Fiske, 2010).

The legitimacy of the social system devaluating women and minority groups has been questioned in our current society. Therefore, status relations are not uniformly considered as stable and impermeable as before. Based on social identity theory we thus expect that both male and female, and both Roma and non-Roma students show in-group favouritism in ability attributions. We hypothesize that *students are more likely to consider their in-group members than their out-group members as clever, in terms of both gender (Hypothesis 3a) and ethnicity (Hypothesis 3b).*

The present study

The present study focuses on ability perceptions among male and female Roma and non-Roma Hungarian sixth-grade primary school students. The Roma constitute a highly disadvantaged minority group in Hungary. Their rate is estimated to be between 3 and 6 percent of the total Hungarian population (Hungarian Central Statistical Office, 2013; Kemény & Janky, 2006), and they have to face the strongest discrimination and prejudice among all ethnic groups (Váradi, 2014).

An earlier study among Hungarian secondary school students has found that Roma students were less likely than non-Roma students to be perceived as clever by their classmates, but did not find such a difference between girls and boys (Grow et al., 2016). Grow and his colleagues, however, have not controlled for students' grades in their analysis.

We analyse cross-sectional dyadic peer nomination data from 21 primary school classes (392 students from 16 schools) using exponential random graph models (Lusher, Koskinen, & Robbins, 2013; Robins, Pattison, Kalish, & Lusher, 2007). ERGMs provide statistical models for social networks and allow us to take into account the social network embeddedness of ability attributions. Controlling for endogenous network processes is necessary to avoid the overestimation of the effects of gender and ethnicity.

Moreover, we examine different aspects of ethnicity and investigate how students' self-declared ethnicity and dyadic peer perceptions about their ethnic group membership are associated with ability perceptions.

Method

Procedure

Survey data has been collected on site in the spring of 2015 among Roma and non-Roma Hungarian primary school students as part of the fourth wave of an ongoing panel study. All participating students were enrolled in the sixth grade[1] (N=1054 students, 53

[1] In the Hungarian educational system, primary school education lasts for eight years and secondary school education lasts for four years. Although several secondary grammar

classes in 34 schools in 28 settlements). The schools were located in the capital city (N=5), in towns (N=9), and in villages (N=20) in the central part of Hungary.

Before the data collection took place, students and parents had received an information letter describing the aim and procedure of the research. Parents were asked to indicate on a consent form whether they allow their child to take part in the study. Students who had been granted parental permission (96.9%) filled out a self-administered tablet-based questionnaire during regular school lessons, under the supervision of trained research assistants. Students were assured that their answers were kept confidential and were used for research purposes exclusively. They were also allowed to refuse to participate in the study.

Participants

For the purpose of the present analysis, we selected those classes from the sample where the response rate reached 75%, the number of participating students was higher than ten, students' school-registered grades were available for the researchers, and at least three self-declared Roma and three self-declared non-Roma students attended the class. Based on these selection criteria, our initial subsample consisted of 25 classes. Later, four more classes had to be excluded from the analysis due to convergence problems[2] (see

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schools offer six-year or eight-year education, the majority of the students attend secondary school in the ninth grade.

[2] One class had to be excluded from the analysis due to convergence problems in all models. Two classes were excluded due to convergence problems in Model 2, and one class was excluded due to convergence problems in Model 3. We repeated the meta-analysis by including these three classes in the models in which they converged (N=24 classes for Model 1, N=22 classes for Model 2), and obtained similar results as in the final analysis. These

details about model convergence in the Analytical Strategy section). Excluded classes were not significantly different from the included ones in terms of network density, class size, the proportion of self-declared Roma students in the class, and the proportion of male students in the class.

The final subsample comprised 21 classes from 16 schools with a mean class size of 19 students (SD=3.7). Students were 13.1 years old on average (SD=0.8) during the fourth wave of the data collection. 53.1 per cent of the students were female and 50 per cent declared to be Roma. The mean of the proportion of boys in the classes was 47.7 per cent (SD=10.2, min=33.3%, max=68.8%); the mean of the proportion of self-declared Roma students in the classes was 51.6 per cent (SD=19.4, min=14.3%, max=82.4%).

Measures

Peer perceptions of being clever. Students were provided with a list of all classmates and they were asked to nominate all the classmates they considered clever (smart). For each class, an adjacency matrix has been created, where a directed tie is present and coded as 1 if student *i* nominated student *j* as clever. Dyads where there were no nominations from *i* to *j* were coded as 0. These ties were used as the dependent variable in the exponential random graph models.

Gender. Students were asked to declare their gender. We included both the sender's and receiver's gender, and the interaction between these variables in the analysis. While the boy sender parameter indicates whether boys are more or less likely

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results suggest that the patterns of ability attributions might be similar in the excluded classes as well.

to send nominations than girls, the boy receiver parameter shows whether boys are more or less likely to receive nominations. The interaction between these two variables models whether boys are likely to nominate boys.

Self-declared ethnicity. In every wave of the data collection, students were asked to classify themselves as 'Hungarian', 'Roma', 'both Hungarian and Roma', or members of 'another ethnicity'. Students who declared to be Roma or both Roma and Hungarian at least once[3] in the first four waves of the data collection[4] were coded as Roma, students who never declared to be Roma or both Roma and Hungarian were coded as non-Roma[5]. For the ten students who did not give valid answers on ethnicity, we imputed the missing data using the ethnic classification given by their head-master[6].

While the Roma sender parameter indicates whether Roma students are more or less likely to send nominations than non-Roma students, the Roma receiver parameter

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[3] Only 7.9 per cent of the students consistently declared to be Roma only. 12.8 per cent declared to be Roma in some waves and both Roma and Hungarian in other waves, 5.4 per cent declared to be both Roma and Hungarian in every wave, and 23.2 per cent declared to be Roma and/or both Roma and Hungarian in some waves and Hungarian in other waves. These data are consistent with the phenomenon that many Hungarian Roma tend to declare both Roma and Hungarian identities if multiple choices are allowed (Kertesi & Kézdi, 2011; Simonovits & Kézdi, 2014).

[4] At the time of conducting the analysis, data from the fifth and sixth waves were not available.

[5] Four students declared to belong to another ethnicity (Rumanian, Polish, Russian, Rumanian-Italian).

[6] In the total sample, 92.2 per cent of the students who were classified as Roma by the head-master declared to be Roma, and 84.9 per cent of the students who were classified as non-Roma by the head-master declared to be non-Roma.

represents whether Roma students are more or less likely to receive nominations. The interaction between these two variables models whether Roma students are likely to nominate Roma students.

Ethnic peer perceptions. Students were provided with a list of all classmates and they were asked to nominate whom they consider Roma. For each class, an adjacency matrix has been created, where, for each dyadic relation, 1 indicates that the respondent (sender) classified the given classmate (receiver) as Roma, and 0 indicates that the respondent did not consider the receiver Roma. These ties were included as dyadic covariates to model the effect of ethnic perceptions in the analysis.

Grade point average. In the Hungarian educational system, students receive summary grades ranging from 1 (fail) to 5 (excellent) from every subject at the end of each semester. Students' grades are mostly known by classmates as well, therefore, they can influence whom classmates consider clever. The summary grades obtained at the end of the fall semester, before the fourth wave of the data collection, were collected from class records for each student. We calculated grade point average for every student based on the summary grades from five subjects: mathematics, literature, Hungarian grammar, history, and foreign language[7]. In the analysis, we controlled for the receiver's grade point average in each dyadic relation. Missing data on grades (2.8%) were imputed with grades received in the preceding or in the following semester.

Friendship. Previous research showed that students are more likely to nominate their friends as clever than to nominate classmates who are not their friends (Grow et al., 2016). Moreover, Foschi (2000) proposed that positive and negative sentiments

[7] In Hungary, subjects in natural sciences such as physics, biology, and chemistry are incorporated in the curriculum at later grades.

(e.g., like and dislike) can affect performance expectations and competence standards. Therefore, we controlled for the friendship relations between the classmates in the analysis. Students were asked to nominate who their friends are in the class. For each class, a friendship matrix has been created, where a directed friendship tie is present if there is a *'He/she is my friend'* nomination from individual *i* to *j*. Friendship ties were included as dyadic covariates in the exponential random graph models.

Structural effects. The interdependencies of students' ability attributions are modelled by structural parameters. The arc parameter represents the students' baseline tendency to nominate others as clever. Beyond this baseline tendency, we controlled for three structural parameters in the exponential random graph models. The reciprocity parameter models whether students tend to reciprocate each other's nominations. Reciprocity is a general pattern in social networks (Snijders, 2002) and has been identified as significant also in ability attributions (Grow et al., 2016). The shared in-ties parameter indicates whether it is likely to occur that students are nominated as clever by the same classmates. A positive shared in-ties parameter would imply similarity in *receiving* clever nominations from classmates. The shared out-ties parameter indicates whether it is likely to occur that students nominate the same classmates as clever. A positive shared out-ties parameter would imply similarity in ability attributions in the classroom that is beyond other effects included in the model. We experimented with models including additional structural parameters as well, without gaining any new insights. The graphical representations of the structural parameters can be found in Table 1.

Analytical strategy

Students' opinions about their classmates' competence are not independent from their peers' opinions. The effects of actor attributes such as gender and ethnicity might thus

be overestimated without controlling for these endogenous processes. Therefore, data were analysed using exponential random graph models (Lusher et al., 2013; Robins et al., 2007). ERGMs provide statistical models for social networks by taking into account the interdependent nature of students' perceptions and explicitly modelling the dependence among nominations.

The dependent variable is the directed tie between students: its value is 1 if student *i* nominated student *j* as clever and 0 otherwise. Possible independent variables include binary, categorical, and continuous individual attributes, dyadic covariates, and network configurations representing endogenous structural processes of the network. The signs of the parameters show whether a given network configuration is more or less likely to occur (positive and negative parameter value, respectively) than we would expect by chance.

Attribute-based parameters in the model show whether students with higher values on the attribute are more likely to send (sender effect) or receive (receiver effect) nominations than students with lower values on that attribute. The GPA receiver parameter, for instance, shows whether students with higher grades are more likely than students with lower grades to be nominated as clever, net of the effects of all other parameters included in the model. Similarly, the boy sender parameter indicates whether boys are more likely than girls to send nominations, whereas the boy receiver parameter shows whether boys are more likely than girls to receive nominations. The interaction between boy sender and boy receiver parameters models whether boys are likely to nominate boys. By considering these parameter estimates simultaneously, conditional odds ratios for each kind of dyads (e.g., boy–girl, girl–boy, boy–boy nominations) can be calculated and compared to a reference category (e.g., girl–girl nominations). The hypotheses can be tested by the pairwise comparison of the relevant odds rations. To

assess whether there are statistical significant differences between the odds ratios additional Wald tests are carried out.

To estimate our ERG models, we used the MPNet program (Wang, Robins, Pattison, & Koskinen, 2014). MPNet estimates the parameters via Monte Carlo maximum likelihood methods (Snijders, 2002). The estimation procedure converges if the simulated networks are similar enough to the observed graph, which is expressed by a t-ratio. After convergence is reached, the Goodness of Fit (GOF) measures of the models are assessed (Lusher et al., 2013). First, we estimated ERG models with the configurations described before for each class separately. Then, we undertook a meta-analysis using the 'metafor' R package (Viechtbauer, 2010) by testing whether the values of the parameters significantly differed from 0, indicating general tendencies in the networks across classes.

We estimated three different types of models based on the different operationalization of students' ethnicity. In Model 1, the *self-declared* ethnicity of the sender and the receiver, and the interaction between these two variables were included. In Model 2, the self-declared ethnicity of the sender was included, and we used Roma perception as a *dyadic covariate* to capture the ethnicity of the receiver. We also included an interaction term between the self-declared ethnicity of the sender and the perceived ethnicity of the receiver. In Model 3, the self-declared ethnicity of both the sender and the receiver, the perceived ethnicity of the receiver, and the interactions between these variables were included.

Results

Descriptive analysis

Table 2 presents the descriptive statistics of the dependent and independent variables.

The average density[8] of the clever network is 32 per cent (SD=10%) across the classes. On average, students are nominated by six classmates as clever. Girls are significantly more often nominated as clever than boys ($t=3.58$, $p<0.001$). Self-declared non-Roma students are significantly more often nominated as clever than self-declared Roma students ($t=3.77$, $p<0.001$). There are no significant differences among the groups, however, with regard to the tendency of nominating others as clever.

The mean GPA students obtained at the end of the fall semester is 2.95 (SD=1.06, 1=fail, 5=excellent). On average, girls have higher GPAs than boys ($t=4.57$, $p<0.01$), and self-declared non-Roma students receive higher GPAs than self-declared Roma students ($t=8.72$, $p<0.001$).

The average density of the friendship network is 30 per cent (SD=8%) across the classes. On average, students are nominated by five classmates as being a friend. Whereas there are no significant differences in the indegrees and outdegrees based on students' gender, self-declared Roma students more often send ($t=-2.27$, $p<0.05$) and receive ($t=-2.95$, $p< 0.01$) friendship nominations than self-declared non-Roma students.

The data show that although self-declared Roma students are classified as Roma more often than non-Roma students ($t=-17.47$, $p<0.001$), they are not consistently classified as Roma by their peers.

Meta-analysis of the exponential random graph models

Table 3 presents the results of the meta-analysis of the separate ERGMs. The arc

[8] The number of nominations present in the network divided by the number of all possible nominations.

parameter represents a baseline tendency for sending nominations and its negative parameter value across the three models reflects the low density of the clever nominations. The reciprocity parameter is not statistically significant from zero, indicating that the occurrence of mutual nominations is not more or less likely than expected by chance given the inclusion of the set of further explanatory variables. The positive shared in-ties parameter shows that some students are nominated as clever by the same classmates or in other words, there is similarity in receiving clever nominations. The negative shared out-ties parameter, however, reflects that given the set of explanatory variables, once students agreed to nominate the same classmate as clever, it is unlikely that they have a further confirmatory tendency to agree upon the attribution of others. The positive GPA receiver parameter indicates that students with higher grades are more likely to be considered clever than students with lower grades. The positive parameter for the friendship tie shows that students are more likely to nominate their friends as clever than classmates who are not their friends[9].

[9] As a rule of thumb, in ERGMs, the goodness of fit of a configuration can be regarded as acceptable if the difference between the observed value and the mean over the simulated sample of graphs, divided by the standard deviation (the GOF t-ratio), is not higher than 2 in absolute value (Lusher, Koskinen, & Robbins, 2013). In nine classes, the goodness of fit procedure yielded t-ratios higher than 2 for some omitted parameters. In seven classes, including the in-ties spread and/or out-ties spread parameters (parameters reflecting the dispersion of the in-ties and out-ties distribution, respectively) improved the goodness of fit of the model. In these models, we obtained very similar parameter values for all other parameters as in our final models. Therefore, we do not present the results of these extended models in the table. We emphasize, however, that the value of the out-ties spread parameter was significantly positive based on the meta-analysis of these seven classes. Furthermore, we

Assessing the hypotheses with regard to gender

Based on the parameter estimates obtained in the ERG models for boy sender, boy receiver, and the interaction between boy sender and boy receiver, we calculated conditional odds ratios for each kind of dyads compared to the girl–girl reference category. These conditional odds ratios are presented in Table 4 and show whether the given dyad occurs significantly more or less likely than nominations in the reference category (between two girls). In order to be able to draw conclusions regarding the statistically significant differences between the likelihoods of any other two dyads, we conducted additional Wald-tests (not presented in the tables).

Based on double standards theory we have expected that controlling for grades, girls are less likely than boys to be considered clever by their classmates (Hypothesis 1a). Thus, we assumed, that girl–girl clever nominations are less likely than girl–boy nominations, and that boy–girl nominations are less likely than nominations between two boys. Contrary to this expectation, girls are less likely to nominate boys than girls as clever (OR=0.37 in Model 1, OR=0.39 in Model 2, OR=0.34 in Model 3, $p<0.001$), and boys are similarly likely to nominate both girls and boys as clever (Wald-tests: ORs: 0.58 vs. 0.65, z=0.60, p=0.55 in Model 1, ORs: 0.58 vs. 0.66, z=0.55, p=0.58 in Model 2, ORs: 0.56 vs. 0.60, z=0.34, p=0.74 in Model 3).

We have also expected that controlling for grades, girls are less likely than boys to devaluate their female peers' competence (Hypothesis 2a). In other words, we assumed that boy–girl clever nominations are less likely than nominations between girls. Although boy–girl nominations are indeed less likely than nominations between

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repeated the analysis without controlling for the friendship relation between the students, and obtained similar results as in our final analysis.

girls (OR=0.58 in Model 1, OR=0.58 in Model 2, OR=0.56 in Models 3, p<0.001), but girls actually are more likely to nominate other girls compared to the likelihood of any other dyads. Thus, with regard to gender, the results are not in line with the predictions based on double standards theory.

Based on social identity theory we have formulated the hypothesis that students are more likely to consider their in-group (same-gender) peers than out-group peers as competent (Hypothesis 3a). In line with this expectation, girl–boy (OR=0.37 in Model 1, OR=0.39 in Model 2, OR=0.34 in Model 3, p<0.001) and boy–girl (OR=0.58 in Model 1, OR=0.58 in Model 2, OR=0.56 in Models 3, p<0.001) nominations are indeed less likely than nominations between girls. Girl–boy nominations are also less likely than nominations between boys (Wald-tests: ORs: 0.37 vs. 0.65, z=4.19, p<0.001 in Model 1, ORs: 0.39 vs. 0.66, z=3.29, p<0.001 in Model 2, ORs: 0.34 vs. 0.60, z=3.39, p<0.001 in Model 3). In contrast to the hypothesis, however, the likelihood of boy–girl nominations do not significantly differ from the likelihood of nominations between boys (Wald-tests: ORs: 0.58 vs. 0.65, z=0.60, p=0.55 in Model 1, ORs: 0.58 vs. 0.66, z=0.55, p=0.58 in Model 2, ORs: 0.56 vs. 0.60, z=0.34, p=0.74 in Model 3). The results are thus only partially in line with the predictions of social identity theory.

Assessing the hypotheses with regard to ethnicity

Based on the parameter estimates obtained in the ERG models for Roma sender, Roma receiver (self-declared), Roma receiver (peer perceived), and the interaction between Roma sender and Roma receiver (both self-declared and peer perceived), we calculated conditional odds ratios for each kind of dyads compared to the non-Roma–non-Roma reference category. These conditional odds ratios are presented in Table 5 and show whether the given dyad occurs significantly more or less likely than nominations in the reference category (between two non-Roma students). In order to be able to draw

conclusions regarding the statistically significant differences between the likelihoods of any other two dyads, we conducted additional Wald-tests (not presented in the tables).

We have expected that controlling for grades, Roma students are less likely than non-Roma students to be considered clever by their classmates (Hypothesis 1b). Thus, we assumed, that Roma–Roma clever nominations are less likely than Roma–non-Roma nominations, and that non-Roma–Roma nominations are less likely than nominations between two non-Roma students. In line with this expectation, non-Roma students are less likely to nominate those students as clever whom they perceive as Roma compared to those whom they perceive as non-Roma (OR=0.68, p<0. 1 in Model 2), although this association is only significant at the 0.1 level. We do not find significant difference, however, if self-declared ethnicity is considered in Model 1 (OR=0.961, p=0.85). Contrary to the expectation of Hypothesis 1b, moreover, Roma students are more likely to nominate Roma peers than non-Roma peers as clever both if self-declared ethnicity is considered (Wald-test: ORs: 1.84 vs. 0.72, z=3.47, p<0.001 in Model 1) and if the sender's perception about the receivers' ethnicity is included in the model as a dyadic covariate (Wald-test: ORs: 1.41 vs. 0.77, z=5.20, p<0.001 in Model 2).

We have also expected that controlling for grades, Roma students are less likely than non-Roma students to devaluate their Roma peers' competence (Hypothesis 2b). In other words, we assumed that non-Roma–Roma clever nominations are less likely than nominations between Roma students. Non-Roma–Roma nominations are indeed less likely than nominations between Roma students both if receiver's self-declared ethnicity is considered (Wald test: ORs: 0.96 vs. 1.84, z=2.90, p<0.01 in Model 1) and if the sender's perception about the receivers' ethnicity is included in the model (Wald test: ORs: 0.68 vs. 1.41, z=3.38, p<0.001 in Model 2). Interestingly, however, after controlling for grades, Roma students are more likely to nominate Roma peers as clever,

than the likelihood of any other dyads. With regard to ethnicity, the results are thus only partially in line with the predictions of double standards theory: non-Roma students are less likely to nominate those students as clever whom they perceive as Roma.

Based on social identity theory we have formulated the hypothesis that students are more likely to consider their in-group (same-ethnic) peers than out-group peers as competent (Hypothesis 3b). In line with this expectation, Roma–non-Roma (Wald tests: ORs: 0.72 vs. 1.84, $z=3.47$, $p<0.001$ in Model 1, ORs: 0.77 vs. 1.41, $z=5.20$, $p<0.001$ in Model 2) and non-Roma–Roma (Wald tests: ORs: 0.96 vs. 1.84, $z=2.90$, $p<0.01$ in Model 1, ORs: 0.68 vs. 1.41, $z=3.38$, $p<0.001$ in Model 2) nominations are indeed less likely than nominations between Roma students, independently of how we measure receiver's ethnicity. Roma–non-Roma nominations are also less likely than nominations between non-Roma students (OR=0.72, $p<0.05$ in Model 1, OR=0.77, $p<0.05$ in Model 1, OR=0.66, $p<0.05$ in Model 3). Non-Roma–Roma nominations, however, are only less likely than nominations between non-Roma students if sender's perception about receiver's ethnicity is considered (OR=0.68, $p<0.01$ in Model 2).

In sum, the findings are mostly in line with the hypothesis derived from social identity theory. It is important to note, moreover, that compared to students who are consistently identified as Roma (both self-declared and perceived) and who are self-declared Roma but not perceived as Roma, Roma students are less likely to nominate those students as clever whom they perceive as Roma, but who identify themselves as non-Roma (OR=2.07 for consistent Roma, OR=1.47 for only self-declared Roma, OR=0.94 for only perceived Roma, Model 3).

The meta-analysis indicated significant heterogeneity among the classes with regard to every parameters except for reciprocity in Model 2. Therefore, we tested whether the proportion of boys and the proportion of Roma students in the class

moderated the effects of gender and ethnicity in the ERG models. We did not find any significant interaction effects.

Discussion

In this study, we examined ability attribution processes among 13-year-old Hungarian primary school students. We investigated how status characteristics and social identity processes play a role in forming students' judgments on their peers' abilities. We analysed ability attributions with exponential random graph models as we posited that they are interdependent with each other. Furthermore, we controlled for publicly observable grades because students' ability attributions are likely to be influenced by the teachers' evaluation.

Based on double standards theory we expected that controlling for grades, female and Roma minority students are less likely than male and non-Roma students to be considered as clever by their classmates (Hypotheses 1a and 1b). Furthermore, we hypothesized that although double standards are set for high and low status students, low status students are less likely to accept them. Therefore, we expected that female and Roma students are less likely than male and non-Roma students to devaluate their female and Roma peers' competence, respectively (Hypotheses 2a and 2b).

Moreover, we contrasted predictions of status characteristics theory with that of social identity theory. Based on the theoretical considerations of in-group favouritism we formulated the hypothesis that controlling for grades, students are more likely to consider their in-group members than their out-group members as clever, in terms of both gender and ethnicity (Hypotheses 3a and 3b).

Our findings are mostly in line with the predictions of social identity theory. Controlling for grades, students are more likely to nominate their in-group peers than classmates from the out-group as clever. One exception has been found: boys are

similarly likely to nominate both boys and girls as clever. Moreover, non-Roma students are more likely to nominate non-Roma students compared to Roma students as clever only if the sender's perception about the receiver's ethnicity is taken into account.

Although in line with double standards theory we have found that non-Roma students are less likely to consider those peers as competent whom they perceive as Roma compared to those whom they perceive as non-Roma, similar association has not been found with regard to gender. One explanation might be that the activation of a double standard depends on whether gender or ethnicity is salient in the situation. If gender is salient in the setting, for instance, men will be judged by a more lenient standard than women in two cases: if the task is considered masculine, or not explicitly linked to gender. If the task is considered feminine, however, male participants do not benefit from the double standard (Foschi, 1996; Foschi et al., 1994).

Whereas there are sharp differences in the test scores of Roma and non-Roma students with Roma students having significantly lower test scores than their non-Roma peers (Kertesi & Kézdi, 2011), girls more and more outperform boys in school. Their advantage in reading literacy has grown in the last decades, and they caught up boys also in science and mathematics. According to the latest PISA results, for instance, 15-year-old Hungarian female students significantly outperformed their male peers in reading comprehension, while did not significantly underperform boys on the science and mathematical literacy tests[10]. Thus, it is possible that school performance is considered rather a feminine task among adolescents.

[10] See the PISA 2015 results at: https://nces.ed.gov/surveys/pisa/pisa2015/index.asp

We have interesting results deriving from our innovative measurement of ethnicity. We have found that Roma students are less likely to consider those peers as clever whom they perceive as Roma, but who identify themselves as non-Roma, than those Roma peers who identify with the Roma group. This finding is in line with previous studies, which showed that Roma students are likely to dislike and bully peers whom they perceive as Roma, but who, at the same time, do not identify themselves as Roma (Boda & Néray, 2015; Kisfalusi, 2016). Based on our results, self-declared Roma students distinct themselves from peers whom they perceive as Roma, but who themselves identify as non-Roma through ability attribution processes as well.

The significance of structural parameters in our analyses demonstrated the non-independence of ability attributions and the appropriateness of the use of social network methodology. The positive shared in-ties parameter indicates that once two students received a nomination of being clever by a third individual, they are likely to share further incoming nominations. This means that students nominated as clever likely share their nominators. Controlling for the shared in-ties mechanism, however, the effect of the shared out-ties parameter is negative. The latter indicates that once students agreed on ability attributions of a third individual, they are not likely to share further outgoing nominations. A positive shared in-ties and a negative shared out-ties parameter is not just a theoretical possibility (see the model for bullying in Huitsing et al., 2012), but is difficult to interpret.

Our study is not without limitations. We analysed data from Roma and non-Roma Hungarian primary school students. The Roma are a highly disadvantaged minority in Hungary and have to face the strongest prejudice among all ethnic groups (Kertesi & Kézdi, 2011; Váradi, 2014). Therefore, ethnicity may be more salient in

social interactions if Roma people are involved, compared with members of other minorities.

Furthermore, double standards theory assumes that students' know each other's prior individual performance assessed by the teachers and they think that teachers' evaluations are unbiased (Foschi, 1996). It is possible, however, that teachers hold biased perceptions of the abilities of certain ethnic or gender groups and students are aware of these biases. School grades may thus be affected by other factors such as students' behaviour (Dee, 2005; Pedulla, Airasian, & Madaus, 1980) or teachers' discriminative grading practices (Burgess & Greaves, 2013; Lavy, 2008; Lindahl, 2007).

Despite these limitations, the empirical findings in this study provide a new understanding of ability attribution processes in classrooms. Our dataset provided a unique opportunity to analyse students' ability attributions net of the effect of teachers' performance evaluations. Our findings have shown that besides school grades, gender, ethnicity, and peers' opinions play a considerable role in ability attribution processes among classmates.

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Table 1. Description and graphical representation of the structural parameters included in the ERG models.

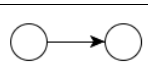
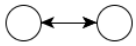
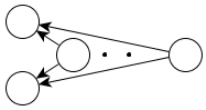
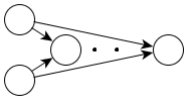
Parameter	MPNet name	Description	Graphical representation
Arc	*arc*	Occurrence of nominations	
Reciprocity	*reciprocity*	Occurrence of reciprocated ties	
Shared in-ties	*A2P-D*	Structural equivalence based on in-ties (being nominated by the same students)	
Shared out-ties	*A2P-U*	Structural equivalence based on out-ties (nominating the same students)	

Table 2. Descriptive statistics of the dependent and independent variables among girls, boys, Roma, and non-Roma.

	Girls		Boys			Roma		Non-Roma		
	Mean	**SD**	**Mean**	**SD**		**Mean**	**SD**	**Mean**	**SD**	
Clever indegree	6.42	4.50	4.89	3.96	***	4.89	3.97	6.51	4.50	***
Clever outdegree	5.66	4.51	5.69	4.80		5.82	4.72	5.53	4.57	
Friendship indegree	5.32	2.68	5.01	2.53		5.47	2.64	4.87	2.56	*
Friendship outdegree	5.00	4.26	5.53	4.76		5.91	4.78	4.59	4.11	**
Roma perception indegree	5.82	5.74	7.00	5.96	*	10.26	4.77	2.49	3.99	***
Roma perception outdegree	6.22	4.17	6.60	5.17		7.27	5.10	5.54	4.01	***
GPA	3.17	1.03	2.69	1.04	***	2.52	0.95	3.37	0.99	***

Note: †p < 0.1, *p<0.05, **p<0.01, ***p<0.001. N=392 students, 21 classes

Table 3. Meta-analysis of exponential random graph models

	Model 1			Model 2			Model 3		
	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p
Structural parameters									
Arc	-6.521	0.506	<0.001	-6.222	0.440	<0.001	-6.491	0.500	<0.001
Reciprocity	-0.108	0.141	0.443	-0.140	0.115	0.222	-0.148	0.129	0.253
Shared in-ties (A2P-D)	0.571	0.123	<0.001	0.547	0.115	<0.001	0.553	0.116	<0.001
Shared out-ties (A2P-U)	-0.363	0.045	<0.001	-0.338	0.048	<0.001	-0.358	0.048	<0.001
Gender									
Boy Sender	-0.540	0.129	<0.001	-0.545	0.133	<0.001	-0.580	0.137	<0.001
Boy Receiver	-0.999	0.182	<0.001	-0.953	0.179	<0.001	-1.076	0.188	<0.001
Boy Sender*Receiver	1.112	0.218	<0.001	1.076	0.228	<0.001	1.139	0.230	<0.001
Roma ethnicity									
Roma Sender	-0.322	0.144	0.025	-0.263	0.134	0.050	-0.411	0.165	0.013
Roma Receiver (self-declared)	-0.040	0.205	0.847				0.216	0.246	0.380
Roma Sender*Receiver (self-declared)	0.976	0.285	0.001				0.581	0.344	0.091
Roma Receiver (peer perceived)				-0.382	0.223	0.086	-0.530	0.272	0.051
Roma Sender*Receiver (peer perceived)				0.992	0.265	<0.001	0.874	0.315	0.006
Control variables									
GPA receiver	1.761	0.176	<0.001	1.699	0.162	<0.001	1.765	0.171	<0.001
Friendship	1.171	0.142	<0.001	1.233	0.156	<0.001	1.195	0.152	<0.001

Notes: In Model 1, students' self-declared ethnicity was included; in Model 2, dyadic peer nominations representing peers' perceptions of their classmates' ethnicity were used. In Model 3, both self-identification and peers' perceptions were considered. N=392 students, 21 classes

Table 4. The effect of gender on ability attributions

		Receiver's gender	
	Sender's gender	girl	boy
Model 1	girl	1.000	0.368***
	boy	0.583***	0.652**
Model 2	girl	1.000	0.386***
	boy	0.580***	0.656*
Model 3	girl	1.000	0.341***
	boy	0.560***	0.597**

Conditional odds ratios are presented, reference category: girl-girl nominations. †p < 0.1, *p<0.05, **p<0.01, ***p<0.001

Table 5. The effect of ethnicity on ability attributions.

		Receiver's ethnicity			
	Sender's ethnicity	Non-Roma	Roma		
Model 1	Non-Roma	1.000	0.961		
	Roma	0.724*	1.848*		
Model 2	Non-Roma	1.000	0.682†		
	Roma	0.769*	1.414		
		Non-Roma	"consistent" Roma (both perceived and self-declared)	Only self-declared Roma	Only perceived Roma
Model 3	Non-Roma	1.000	0.731	0.341	0.589†
	Roma	0.663*	2.074*	1.470	0.935

Conditional odds ratios are presented, reference category: non-Roma–non-Roma nominations. † p < 0.1,*p<0.05, **p<0.01, ***p<0.001. N=347