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**Interethnic Relations among Roma and Non-Roma Students
in Hungary**

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Doctoral Dissertation

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1. INTRODUCTION

1.1. INTERETHNIC RELATIONS IN SCHOOLS

This dissertation focuses on positive and negative relations between Roma minority and non-Roma majority students in Hungary. Interethnic relations are important to study because positive relations may facilitate the formation of more positive attitudes towards other ethnic groups (Allport, 1954; Pettigrew and Tropp, 2006). This can decrease intergroup tensions and thus contribute to the social cohesion of society (Kertesi and Kézdi, 2009a; Stark, 2011). Negative interethnic relations, however, may further increase the level of ethnic prejudice (Pettigrew, 2008; Stark et al., 2013).

Due to developmental processes, prejudices and stereotypes already emerge in childhood (Aboud, 1988; Nesdale et al., 2005a, 2005b). As individuals get older, their social environment exerts stronger influence on their prejudicial attitudes (Raabe and Beelmann, 2011). During adolescence, peer groups become especially important for youths (Hartup, 1993). Moreover, adolescents spend a considerable time among their classmates. Therefore, it is of particular interest to investigate interethnic relations of adolescence in their school environment. Integrated schools can provide opportunity for positive contact with ethnic outgroups at an age when peers exert particular influence on pupils.

Already the Coleman report (1966) pointed out that school integration can have advantageous effects on minority students' social integration. Ethnic or racial¹ mixing

¹ Scholars from the United States typically differentiate between *race* and *ethnicity*. The term *race* is used when they refer to whites, blacks or African Americans, Asians, and Native Americans. *Ethnicity* is used when they refer to people of Hispanic ethnicity, or different ethnic groups within one racial category. In Europe, scholars typically focus on segregation based on ethnic groups. Following the American scientific tradition, we use the term *race* if we differentiate between African American, Asian, and white students in contexts describing the situation in the United States. But we always refer to ethnic groups in European or Hungarian contexts. *Interethnic* or *interracial relations* refer to relations that cross ethnic or racial boundaries; *intra-ethnic* or *intra-racial relations* describe relationships within an ethnic or racial group.

of students may facilitate the formation of more positive attitudes towards ethnic outgroups as well as interethnic relationships between students. Thus, it can increase the accessible social capital of minority students, decrease interethnic tensions among groups, and strengthen the social cohesion of the given society (Kertesi and Kézdi, 2009a; Stark, 2011).

School integration as an opportunity for contact, however, does not automatically lead to relational integration² among students. Intra-ethnic friendships are usually more common in school classes than interethnic ones even if students have the possibility to make friendships with members of other ethnic groups (Baerveldt et al., 2004; Boda and Néray, 2015; Hallinan and Williams, 1989; Kao and Joyner, 2004; Moody, 2001; Mouw and Entwisle, 2006; Quillian and Campbell, 2003; Rambaran et al., 2015; Rodkin et al., 2007; Smith et al., 2014). Moreover, empirical evidence does not always support the reasoning that integrated school settings contribute to the reduction of negative intergroup attitudes and to the formation of interethnic social relationships (Stark, 2011). In some cases, researchers even found the opposite effect (Csákó, 2011; Moody, 2001; Vervoort et al., 2011).

Therefore, it is especially important to examine whether formal integration of students, measured as the ethnic heterogeneity of classes, contributes to substantive integration of pupils, measured as the quantity and quality of positive interethnic relations (Moody, 2001). Furthermore, the investigation of negative relations between ethnic groups is also of particular interest, since formal integration of students can lead to the formation of negative interethnic relations and interethnic bullying, which may further increase the level of ethnic prejudice (Pettigrew, 2008; Stark et al., 2013). Negative interethnic relations may undermine the positive effects of desegregation on social integration and

² In this study, the term *educational* or *formal integration* refers to the situation when minority and majority students are enrolled in schools in line with their proportion in the local population. *Segregation* occurs when the proportion of minority or majority students in a school or class highly exceeds their proportion in the local population. The term *relational* or *substantive integration* describes those situations when positive social networks (e.g. friendship) of students cross ethnic boundaries.

social cohesion, if cross-ethnic negative relations and bullying among pupils of different ethnic background are more prevalent than positive ones.

Although negative relations play a significant role in explaining performance, motivations, well-being, and perceptions of intergroup conflict (Labianca et al., 1998; Labianca and Brass, 2006), social network researchers have mostly concentrated on the positive aspects of social networks. The investigation of negative relations, however, is particularly important in school contexts, where disliking relations and aggressive behaviour can lead to isolation, exclusion, low academic achievement, and psychological maladjustment (Card, 2010; Faris and Felmlee, 2014; McKenney et al., 2006; Veenstra et al., 2010). Though networks of negative relations are usually sparser than that of positive ones (Berger and Dijkstra, 2013; Boda and N  ray, 2015; Huitsing et al., 2014, 2012; Rambaran et al., 2015), Card (2010) found in a meta-analytic review of earlier studies that approximately one third of children and adolescents have antipathetic peer relationships.

Since the Supreme Court of the United States declared, in its desegregation decision of 1954 (*Brown vs. Board of Education*), that schools are not legally allowed to separate students based on their race (Coleman et al., 1966; Moody, 2001), US scholars have devoted increasing attention to the various effects of school desegregation and contact between black and white students (Coleman et al., 1966; Hallinan and Williams, 1989, 1987; Longshore and Prager, 1985; Shrum et al., 1988; Tuma and Hallinan, 1979). As the number of Hispanic and Asian students has increased in the American adolescent population (Hamm et al., 2005), scholarly attention has turned towards these minority groups as well (Kao and Joyner, 2004; Moody, 2001; Mouw and Entwisle, 2006; Quillian and Campbell, 2003).

In Europe, most researchers investigating social relations of students have focused on relations between members of immigrant groups and the majority society (e.g. Baerveldt et al., 2004; Feddes et al., 2009; Leszczensky, 2013; Leszczensky and Pink, 2015; Smith et al., 2014; Tolsma et al., 2013; Vervoort et al., 2011, 2010). The Roma, one of the largest ethnic groups of Europe, have received less attention, though Roma people have been an integral part of many European countries for centuries. This study aims to fill this gap and investigates the extent and quality of positive and negative

relationships between Roma, the largest ethnic minority group in Hungary, and non-Roma Hungarian students.

1.2. THE SITUATION OF THE ROMA MINORITY IN HUNGARY

The Roma constitute the largest ethnic minority group in Hungary. Their rate is estimated to be between 3 and 6 percent³ of the total Hungarian population (Hungarian Central Statistical Office, 2013; Kemény and Janky, 2006; Ladányi and Szelényi, 1997), and around 10-12 percent of school-age children (Kemény and Janky, 2006). Different Roma groups have been living in Hungary for centuries, and they have often experienced separation and exclusion by the majority society (Kertesi and Kézdi, 2011).

Under the socialist era the employment rate was generally high in Hungary, both for the Roma and non-Roma population. Data of a survey from 1971 suggest, for instance, that whereas 87.7 percent of working-age (15-59) men were active income earners in Hungary, the corresponding ratio was 85 percent among the Roma population (Kemény and Janky, 2006). With the emergence of the market economy the structure of the labour market changed substantially, and the unemployment rate increased drastically in the first half of the 1990's. Lots of people lost their jobs and became locked into permanent poverty (Szelényi, 2001). The rate of job losses was particularly high among the Roma due to the lower average level of education, the regional distribution of residences, the collapse of sectors employing high rate of Roma, and ethnic discrimination. Whereas nationwide 30 percent of employees lost their jobs between 1985 and 1993, the ratio was 55 percent among the Roma population (Kemény and Janky, 2006). Some authors argue that in the post-socialist time period not just the extent, but also the character of poverty has changed, resulting in extreme and long-term

³ Different estimations exist depending on the way of classification. Based on the 2011 population census the proportion of those people who declared themselves as Roma is 3.11 percent of the Hungarian population (Hungarian Central Statistical Office, 2013). Kemény and Janky (2006) estimated the proportion of those people who are classified as Roma by the non-Roma community to be 5-6 percent (Kemény and Janky, 2006).

poverty of certain social groups, and the formation of a Roma underclass⁴ in Hungary (Ladányi and Szelényi, 2006).

As a result of the strong association between socio-economic status, educational attainment, and employment opportunities in Hungary, a significant gap still exists in terms of education and employment between the Roma and non-Roma population (Kertesi and Kézdi, 2011). This gap could only be decreased by providing more equal educational opportunities for Roma children. According to the PISA data, children's family background has a considerably greater impact on their academic performance in Hungary, than in the OECD countries, on average (Berényi et al., 2008). Moreover, Hungary belongs to those countries where the association between one's education and labour market participation is particularly strong. While the employment rate for people with tertiary education was 78.6 percent in 2010; among those with only a primary or lower secondary education, the employment rate was only 37.6 percent (OECD, 2012). Roma children are more likely not to continue their studies at all after finishing primary school, or to choose vocational schools, which do not provide entrance to tertiary education in Hungary, and are less likely to choose secondary technical or grammar schools than non-Roma children. Furthermore, the dropout rate of Roma students is considerable higher during their secondary education than that of non-Roma youths (Havas and Liskó, 2006; Kertesi and Kézdi, 2009b).

The average test score of Roma eight graders is approximately one standard deviation below the average of non-Roma eight graders for both reading and mathematical literacy skills based on data of the Hungarian National Assessment of Basic Competences in 2006. This gap is similar to the gap between African-American and white students in the United States 30 years ago. However, the differences between the two ethnic groups can be explained almost entirely by differences in health, parenting,

⁴ The term 'underclass' refers to a social group suffering from extreme economic and social exclusion. An underclass is constituted by the poorest social strata, typically from an underprivileged ethnic group. The upward mobility of economically successful members of the ethnic group results in exclusion and segregation of the remaining members of the group. Ladányi and Szelényi (2006) suggest that such a Roma underclass formed in some Eastern European countries, including Hungary, during the transition.

parental education and income, and access to high-quality education (Kertesi and Kézdi, 2011).

Educational segregation of socially disadvantaged and Roma students is a substantial problem in Hungary (Havas, 2008; Havas and Liskó, 2005; Kertesi and Kézdi, 2012, 2009a). As children's academic skills and dispositions are in association with the social position of their family (Bourdieu, 1978; Kertesi and Kézdi, 2005a), and as socio-economic status correlates with ethnicity in Hungary (similarly to many other countries), selection of students by abilities results in segregation based on social background and ethnicity, and vice versa (Berényi et al., 2008; Kertesi and Kézdi, 2005a).

Selection of children of different social background into different schools, or into different classes within the same school, was already observable before the political transformation in 1989 (Ladányi and Csanádi, 1983). Focusing on Roma students, the extent of between-school segregation has been increasing over the past few decades (Kertesi and Kézdi, 2013, 2012). Reasons include residential segregation of Roma families, segregationist local educational policies, the system of free school choice⁵, and middle class student mobility (Berényi et al., 2008; Kertesi and Kézdi, 2013, 2009a, 2005a, 2005b). Schools enrolling high rates of Roma students often provide lower quality education than schools educating majority middle class students regarding the quality of school facilities, educational services, and qualifications and motivations of teachers (Havas and Liskó, 2005; Kertesi and Kézdi, 2005a). This phenomenon further increases educational inequalities between social groups.

⁵ In Hungary, schools are required to admit all children from their own district, but if they do not reach the maximum capacity number for children, they are allowed to enrol students living outside of the district. This educational system allows parents to send their children to any available school, if there is space for them.

1.3. THE SOCIAL CONSTRUCTION OF ETHNICITY AND RACE

In contemporary sociology, ethnic and racial categories are mostly regarded as social constructs (American Sociological Association, 2003; Barth, 1969; Brubaker, 2009). It implies that in different countries and communities, different opinions exist on where ethnic and racial boundaries lie, and who belongs to the certain categories. Not only different societies, but groups or people within the same society might also lack consensus about ethnic and racial categorization (Harris, 1970; Telles and Paschel, 2014). Moreover, ethnic and racial self-identification of individuals might change in different contexts and over time (Eschbach and Gómez, 1998; Harris and Sim, 2002; Hitlin et al., 2006; Ladányi and Szelényi, 2006; Saperstein and Penner, 2012; Simonovits and Kézdi, 2014; Telles and Paschel, 2014).

Whereas social theories have widely recognized and emphasized that ethnicity and race are social constructs, empirical studies still usually treat these concepts as fixed characteristics of individuals. Saperstein et al. (2013) warn that except some subfields, empirical sociology has not yet incorporated the constructivist approach into the standard practice of research. They suggest that researchers should be more reflexive and critical when using ethnic and racial categories in their analyses, and explicitly address the question how the selected way of operationalization affects the results they find.

It has been shown in several studies that research findings depend on the way of ethnic and racial classification included in the analysis (Csepeli and Simon, 2004; Ladányi and Szelényi, 2006; Saperstein and Penner, 2012; Telles and Lim, 1998). The research question may determine which way of measurement of ethnicity and race is most useful in the given situation (Kertesi, 1998; Saperstein, 2006; Wilkinson, 2010). Classification by others, on one hand, might be more appropriate when the aim is to examine inequalities and discrimination in a social context, where members of majority society sharply differentiate themselves from minority groups (Havas et al., 1998; Kertesi, 1998; Penner and Saperstein, 2008; Saperstein, 2006; Telles, 2002; Telles and Lim, 1998). Ethnic self-identification, on the other hand, might be used in studies focusing on attitudes and motivations (Saperstein, 2006).

In this dissertation, we aim to contribute to the understanding of the construction of ethnicity by examining the determinant factors of ethnic classification. Moreover, we explicitly address the question how different ways of ethnic classification affect our findings in quantitative empirical research. We study interethnic relations by analysing different social networks of Hungarian Roma and non-Roma adolescents, and investigate how the inclusion of self-declared ethnic identification of students and peers' perceptions of classmates' ethnicity alter our results.

1.4. RESEARCH QUESTIONS

Our research focuses on positive and negative relations between Roma and non-Roma Hungarian students. Educational integration of Roma pupils is a widely researched topic in Hungary (Berényi et al., 2008; Havas and Liskó, 2005; Kertesi and Kézdi, 2011, 2009a), but less is known about the relational integration of classmates of different ethnic background. Some aspects of interethnic relations among Roma and non-Roma secondary school students, however, have already been examined based on the same dataset we analyse in these studies (Chapter 2 provides a detailed description of the dataset).

Boda and Néray (2015) focused on the friendship and disliking relations among Roma and non-Roma students and provided a detailed cross-sectional analysis of the complex structure of these networks. As they have already examined the likelihood of the formation of interethnic friendships among Roma and non-Roma students, we extend this research line, and analyse the quality of interethnic friendships. Moreover, whereas they concentrated on the negative affective relations among ethnic groups, we investigate the behavioural aspects of negative interethnic relations. Therefore, we focus on bullying among Roma and non-Roma secondary school students. Furthermore, similarly to Boda and Néray (2015), we not only concentrate on self-declared ethnic identification of students, but also include peers' perceptions of classmates' ethnicity in the analyses. To better understand the nature of ethnic classification, we also devote a chapter to the determinants of ethnic classification among secondary school students.

To investigate these research topics we formulated three research questions. First, we would like to know which factors influence the ethnic classification of minority

students. Specifically, we test whether socio-economic status, social networks, and peers' and teachers' perceptions of academic abilities and achievement are associated with being classified as Roma. Second, we examine whether there are any similarities between the characteristics of inter- and intra-ethnic positive relations. Especially, we focus on the question whether intra- and interethnic friendship nominations differ from each other with regard to mutuality, trust, helpfulness, and shared activities. Third, we investigate whether bullying is more common between same-ethnic students or between students of different ethnic background.

1.5. OVERVIEW OF THE DISSERTATION

The thesis consists of three empirical studies. All of the studies make use of the same dataset. *Chapter 2* therefore describes the research design and data collection of the study used in this dissertation (*'Wired into Each Other: Network Dynamics of Adolescents in the Light of Status Competition, School Performance, Exclusion and Integration'*). Data of the four-wave panel study were collected by the Research Center for Educational and Network Studies (RECENS) between the autumn of 2010 and spring of 2013 among Roma and non-Roma secondary school students. In this dissertation, the first two waves of the dataset is used. For the empirical analyses, subsamples were selected based on the response rate and the proportion of minority students in the classrooms.

In *Chapter 3* we examined the determinants of ethnic perceptions. We expected that students living under better socio-economic circumstances are less likely to be classified as Roma by their classmates than students living under worse socio-economic conditions. We hypothesized that students having more Roma friends are more likely to be classified as Roma than students having fewer Roma friends. We also assumed that students who are perceived by peers and teachers as having better academic abilities and achievement are less likely to be classified as Roma by their classmates than students perceived as having lower academic abilities and achievement. For data analysis, fractional regression models were used. Based on a subsample of 23 classes we found that consistent with our hypotheses, socially disadvantaged students, students having more Roma friends, and students who are perceived by classmates and teachers as less smart and clever are more likely to be classified as Roma by their peers over time, even

after controlling for students' ethnic self-identification. The regression analysis suggests, however, that other effects of peers' and teachers' perceptions of academic abilities and achievement on Roma classification are not in line with the proposed hypothesis.

In *Chapter 4*, we investigated the quality of interethnic friendships compared to intra-ethnic ones. Based on previous studies we expected that interethnic friendship nominations are less often reciprocated, and less frequently characterized by co-occurring trust and jointly spent spare time nominations than intra-ethnic ones. We also assumed that nominated interethnic friends are less often perceived helpful than intra-ethnic ones. We not only measured self-declared ethnicity of students, but included peers' perceptions of classmates' ethnicity in the analysis as well. In a subsample of 13 classes, we summed the number of inter- and intra-ethnic outgoing friendship nominations and calculated the proportion of reciprocated nominations, and the proportion of outgoing friendship ties co-occurring with outgoing trust, perceived helpfulness, and jointly spent spare time nominations. In line with our expectations, we found that interethnic friendship nominations are indeed less frequently characterized by co-occurring trust, perceived helpfulness, or jointly spent spare time nominations than intra-ethnic ones. These associations hold if we include self-declared ethnicity as well as peers' perceptions of ethnicity in the analysis. Analysing self-declared ethnicity, we also found that interethnic friendship nominations are less often reciprocated than intra-ethnic ones. In the case of ethnic peer perceptions, however, outgoing nominations of non-Roma students are slightly more frequently reciprocated by classmates perceived as Roma than by classmates perceived as non-Roma.

In *Chapter 5*, we investigated the associations between ethnicity and bullying among majority and minority secondary school students. Based on social identity theory we expected that bullying occurs more likely between than within ethnic groups. Based on social misfit theory we hypothesized that minority students are more likely to be bullied by majority peers than majority students by minority peers. We also emphasized the importance of measuring ethnicity as peer perception, arguing that not only self-declared ethnicity of students, but classmates' ethnic perceptions are also relevant in the formation of social relations. To test our hypotheses we analysed cross-sectional social network data. Bullying and victimization was measured from the perspectives of both

the bullies and the victims, using dyadic peer nominations of students. For data analysis, exponential random graph models were used, which enabled us to describe the structure of bullying nominations in the classrooms. Results of the meta-analysis of 12 classes showed that after controlling for gender, socio-economic status, and structural characteristics of the bullying networks, self-declared ethnicity of the students does not have significant effect on the likelihood of bullying and victimization. If peer classification is being considered, however, students classified as Roma by their peers are more likely to be nominated as both bullies and victims, than students perceived as non-Roma.

In *Chapter 6*, we summarize the main findings of the thesis, discuss the theoretical and practical implications of the results, and formulate several suggestions for the directions for future research.

2. RESEARCH DESIGN AND DATA COLLECTION

2.1. RESEARCH DESIGN

The research was conducted under the project *‘Wired into Each Other: Network Dynamics of Adolescents in the Light of Status Competition, School Performance, Exclusion and Integration’* funded by the Hungarian Scientific Research Fund (OTKA K/81336). Data collection of the four-wave longitudinal panel study took place between the autumn of 2010 and spring of 2013. Data were collected by the MTA TK ‘Lendület’ Research Center for Educational and Network Studies (RECENS). The result of the research project is a unique panel network database containing data on secondary school students’ academic performance, motivations, aspirations, socio-economic status, and ethnicity combined with self-reported social network data. The dataset provides unique opportunity to examine research questions focusing on the associations between individuals’ characteristics and their actual or perceived position in the structure and hierarchy of the class.

The main aim of the project was to examine ethnic segregation of social networks of students. We assumed that ethnic integration, including the integration of Roma students in Hungary, can be best understood by investigating the positive, negative, and romantic relations students form with each other. The formation and dynamics of social networks in classrooms, however, are strongly interrelated with other aspects of school life such as academic achievement and status competition (Moody, 2001). Status competition, for instance, may strengthen segregation and contribute to the exclusion of socially disadvantaged students (Coleman et al., 1966). In other cases, status competition may result in the exclusion of students with high academic achievement. Moreover, academic achievement might influence status and popularity differently in different classrooms or ethnic groups (Fryer Jr. and Torelli, 2010).

2.2. SAMPLING

As the research focused on social networks, the sampling procedure followed the tradition of other network studies such as the *Teenage Friends and Lifestyle Study* (Pearson and West, 2003), the *Dutch Social Behavior Data Set* (Houtzager and Baerveldt, 1999), or *The Arnhem School Study* (Stark et al., 2013; Stark and Flache, 2012). Instead of having a large representative sample of the Hungarian secondary school students or classes, our main aim was to collect data on every student of the selected classes in order to get information on complete networks of the classrooms. Due to lack of financial resources, we were not able to select a representative sample of school classes in Hungary; therefore, we aimed to select a heterogeneous sample with regard to certain characteristics and minimize the costs of data collection. Thus, we decided to start to collect data in all 9th-grade classrooms of the selected schools.

To get a heterogeneous sample we selected 44 classes of 7 secondary schools including vocational, technical, and grammar schools⁶. The schools were located in the capital city, in a large town, and in two middle-sized towns (with a population of 10 000-15 000 people) in Hungary. Due to our main research questions, schools with a high proportion of Roma students were overrepresented in the sample. Although we managed to achieve heterogeneity among the classes with regard to the proportion of Roma students, we have to take into account that schools in the sample are concentrated in the capital city and in an Eastern county of Hungary. Since large regional differences exist in the history, cultural characteristics, assimilation processes, and socio-economic status of Roma populations in Hungary (Havas, 1999; Kemény et al., 2004), students in these schools do not represent the Roma student population in Hungary. Thus, interethnic relations and classification processes might show different patterns in other areas in Hungary than in the sample of the study.

⁶ In Hungary, there are three types of secondary schools. Education in vocational schools lasts for three years and does not provide the possibility to enter tertiary education. Education in secondary technical and grammar schools lasts usually for four years and ends with a final exam. After the final exam students have the possibility to continue their studies at a college or university.

The longitudinal research started in the autumn of 2010 among all 9th-grade students enrolled in the selected schools (N=1425, mean age = 15.1 years). Then, data were collected in the spring of 2011, 2012, and 2013. During the four waves of the research there were some changes in the number of participating classes and students due to changes in class compositions. In sum, approximately 1800 students participated in at least one wave of the data collection. More girls than boys participated in the research (see Table 2) because a lot of vocational and technical school classes in the sample provided education for professions that are more likely to be chosen by female students than by male students.

Table 1. Distribution of the sample across schools and settlement types in wave 1

	Secondary grammar school	Secondary technical school	Vocational school	Total
Capital (1)	4	0	0	4
Capital (2)	0	4	4	8
Large town (1)	5	0	0	5
Large town (2)	0	4	6	10
Middle-sized town (1)	3	1	0	4
Middle-sized town (2)	0	2	4	6
Middle-sized town (3)	3	1	3	7
Total	15	14	14	44

Table 2. Descriptive statistics of the sample

	Wave 1	Wave 2	Wave 3	Wave 4
number of students (classrooms)	1425 (44)	1378 (44)	1154 (41)	980 (38)
number of students (classrooms) in ... classes				
vocational	548 (17)	521 (17)	369 (15)	122 (5)
secondary technical	390 (12)	374 (12)	316 (11)	409 (18)
secondary grammar	487 (15)	483 (15)	469 (15)	449 (15)
boy	38.9%	40.0%	38.8%	40.3%
self-declared ethnicity				
Hungarian	800	816	808	689
Roma	172	131	80	40
Roma and Hugarian	136	131	102	62
other	15	22	12	9
mother's highest education				
less than 8 years of primary school	3.2%	3.1%	2.1%	1.1%
primary school	18.1%	18.9%	16.8%	14.9%
vocational school	19.9%	20.3%	21.3%	20.1%
secondary technical school	8.8%	8.5%	13.6%	12.3%
secondary grammar school	8.6%	10.5%	10.9%	13.5%
college (BA)	12.8%	12.6%	13.4%	13.5%
university (MA)	4.5%	4.8%	6.5%	7.1%
father's highest education				
less than 8 years of primary school	2.3%	1.7%	1.0%	0.8%
primary school	14.0%	14.5%	13.0%	9.6%
vocational school	30.0%	32.4%	34.5%	34.5%
secondary technical school	10.9%	11.0%	13.7%	16.8%
secondary grammar school	4.0%	4.6%	5.3%	4.7%
college (BA)	6.9%	6.2%	7.5%	6.8%
university (MA)	5.1%	4.9%	6.3%	6.9%
number of books at home				
0-10 books	11.9%	13.1%	11.5%	8.1%
11-25 books	11.6%	11.5%	10.4%	8.0%
26-100 books	19.5%	18.6%	19.5%	18.5%
101-200 books	14.2%	14.8%	18.8%	18.0%
201-500 books	11.1%	13.4%	14.1%	15.6%
more than 500 books	10.9%	11.0%	12.8%	16.0%

Note: missing data on the variables are not presented in the table. The composition of classes changed in the fourth wave, because in one of the schools, classes had been completely reorganized.

2.3. QUESTIONNAIRE

The study and the questionnaire were designed to allow researchers to examine the interrelatedness and co-evolution of social networks and other individual, dyadic, and classroom characteristics applying recently developed statistical methods. As the main focus of the research was on ethnic integration, we measured Roma identification and classification three different ways. First, self-declared ethnic identification of students was measured by asking students to classify themselves as '*Hungarian*', '*Roma*', '*both Hungarian and Roma*', or '*other ethnicity*'. Roma students were also asked to indicate which Roma subgroup they belonged ('*Lovari*', '*Boyash*', '*Romungro*', other). Second, we measured the ethnic classification made by peers (perceived ethnicity). Students were provided a list of all classmates and they were asked to nominate whom they considered Roma. Third, teachers were also asked to classify every student in the class as Roma or non-Roma. These data allow us to compare the different kinds of measurements of ethnicity and their effects on ethnic integration.

Similarly to ethnicity, we measured students' status in the classrooms several ways. For instance, all students were asked to evaluate his or her relationship to other classmates. Positive and negative relations were measured on a scale ranging from -2 to 2, where -2 represented '*I hate him/her*', -1 indicated '*I do not like him/her*', 0 referred to '*He/she is neutral to me*', 1 indicated '*I like him/her*' and 2 represented '*He/she is my friend*'. Counting the nominations we can calculate the number of indegrees students got in the positive and negative networks which is often used as the measure of sociometric status (Coie and Dodge, 1988; Lafontana and Cillessen, 1999; Newcomb et al., 1993). We also know whom the students respect and disdain ('*Who do you look up to?*'; '*Who do you look down on?*') and whom students think their classmates respect or disdain ('*Who do your classmates look up to?*'; '*Who do your classmates look down on?*').

Furthermore, we measured students' perceptions of several characteristics of their peers. We asked whom they considered clever, pretty/handsome, gossipy, charitable, funny, quarrelsome, pointdexter, reserved, and so on. We also measured shared activities by asking with whom students usually go home together, have private classes or do sports together, spend their spare time together, and study together. We asked who they trust, on whom they could count if they needed help, who they bully, or by whom they are

being bullied. With regard to questions about students' social networks and opinions about the characteristics of their classmates, pupils were allowed to nominate as many classmates as they wanted in an alphabetic roster.

2.4. PROCEDURE

Before data collection, an information sheet and a consent form were sent to the parents in cooperation with the schools. In this information sheet parents were informed about the organization that collected the data, the aim of the data collection and research, and how data would be used. Parents' passive consent for their children's participation was requested.

Students were asked to fill in a paper questionnaire under the supervision of a trained research assistant. Students were also informed at the beginning of the questionnaire about the organization that collected the data, the aim of the data collection and research, and how data would be used. They were assured that their answers would be kept confidential and would be used for research purposes exclusively. The participants took part in the research on a voluntary basis. They were allowed to refuse to participate in the study, or to refuse to answer some of the questions. In order to provide anonymity, each student was given a unique code of four digits. The questionnaires did not contain any other information through which students could be identified. In order to get additional information on students and classes, questionnaires with form-masters were also filled in by trained interviewers.

2.5. SAMPLE SELECTION

For the analyses presented in this dissertation, subsamples of classrooms were selected. As the dissertation focuses on interethnic relations, the subsamples contain classrooms attended by at least 3 (10%) self-declared Roma students. Since the number of Roma students dropped significantly in the third and fourth waves (see Table 2), these waves provide only limited opportunity to analyse interethnic relations. Hence, we restricted our analysis to the first two waves. In Chapter 3 and 4, data from both the first and second waves are used. In Chapter 5, a cross-sectional analysis based on data from the second wave is conducted. The first wave of the research was organized a few weeks

after students had started their secondary education. Until this time students had limited opportunity to get to know each other. The second wave followed six months later. During this time pupils had chance to get to know their classmates better, and engage in various social relations with them.

We have also taken into account the response rate in the classrooms. In social network analysis, it is advised to concentrate on classes with less than 20% of missing data in the relevant network items (Huisman, 2009). In chapters where individual nominations are analysed (Chapter 4 and 5), therefore, classrooms with less than 20% of missing data have been selected. In Chapter 5, where students are the units of analysis and aggregated measures are used, classrooms with less than 30% of missing data have been selected. The characteristics of the exact subsamples of the different studies are detailed in the subsequent chapters.

3. THE DETERMINANTS OF ETHNIC CLASSIFICATION⁷

3.1. INTRODUCTION

Ethnic classification might have serious consequences on minority members' economic and social circumstances. People being classified as members of a stigmatized minority often face social and economic exclusion in a lot of areas of life. Roma people in Hungary, for instance, have to face strong discrimination and prejudice by members of the majority. This phenomenon results in residential as well as school segregation, since non-Roma Hungarians often leave areas and schools with a high proportion of Roma population (Kertesi and Kézdi, 2013; Ladányi and Szelényi, 2006). People perceived as Roma are also less likely to be hired by employers than non-Roma applicants (Sik and Simonovits, 2008). These mechanisms, together with other economic factors, contribute to the existence of a gap between the Roma and non-Roma population as for their employment rate and average level of education (Kemény and Janky, 2006; Kertesi and Kézdi, 2011).

Therefore, it is of primary interest to analyse the mechanisms that govern ethnic classification. People's perceptions of each other's ethnicity do not only depend on self-declared ethnicity, but several different factors such as physical characteristics, language use, family name, lifestyle, residence, social position, or social status also play a role in ethnic classification (Csepeli and Simon, 2004; Telles, 2002; Telles and Paschel, 2014). Ethnic classification, the way others categorize someone as a member of an ethnic group may thus be different from ethnic identification, the way individuals identify themselves ethnically (Boda and Néray, 2015; Csepeli and Simon, 2004; Ladányi and Szelényi, 2006; Messing, 2014; Saperstein and Penner, 2012; Telles and Lim, 1998). Moreover, ethnic classification and identification might influence each other, and both of them can change over contexts and time (Csizmadia et al., 2012; Eschbach and Gómez, 1998; Ladányi and Szelényi, 2006; Saperstein and Penner, 2012; Simonovits and Kézdi, 2014).

⁷ A revised version of this chapter has been submitted for publication.

This study examines the determinants of ethnic classification in a special context: in secondary school classrooms. We analyse data from 23 classes of a Hungarian panel study conducted among Roma and non-Roma secondary school students. We investigate whether students' socio-economic status, social ties, and their classmates' and teachers' perceptions of their academic abilities and achievement exert an influence on how their ethnicity is perceived by their classmates. To test our hypotheses we use fractional regression models (Papke and Wooldridge, 1996; Ramalho et al., 2011), which enable us to use an aggregated dependent variable measuring the proportion of classmates who classify the respondent as Roma. First, to explore associations between the independent variables and ethnic classification, we do cross-sectional analyses based on the first- and second-wave data separately. Second, in order to analyse changes in ethnic classification over time, we conduct a longitudinal analysis.

As ethnic self-identification of individuals and ethnic classification by others are strongly interrelated with each other, we review theories and empirical findings focusing on both concepts in the next sections. Then, we describe the research and data analysed in this study, and present descriptive results, and the results of the regression analyses. The study ends with a discussion of the implications of the findings.

3.2. THEORETICAL BACKGROUND

3.2.1. Theories of Formation of Ethnic Identity, Identification, and Classification

From a psychological point of view, long-term developmental processes of identity change can be identified occurring in specific periods of life (Vignoles et al., 2011). Adolescence is theorized as a particularly important period of identity formation (Erikson, 1968), when racial and ethnic identity⁸ also develops (Hamm et al., 2005; Hitlin et al., 2006; Phinney, 1993). During these years friends play a crucial role in creating one's identity and self-concept (Hartup, 1993; McFarland and Pals, 2005). Therefore, ethnic self-identification of peers and classification processes might have a large impact on adolescents' ethnic identity.

Social-psychological approaches rather tend to focus on short-term contextual fluctuations in identity (Vignoles et al., 2011). *Social identity theory* (Tajfel, 1982; Tajfel and Turner, 1979) 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 and Hogg, 2010). People who are similar to the self are seen belonging to the ingroup, people who are dissimilar from the self are classified as members of the outgroup. Individuals try to distance themselves from less desired memberships, but if people are classified into a category, they attempt to positively redefine ingroup attributes, and establish a positive distinctiveness from other social groups (Tajfel, 1982; Tajfel and Turner, 1979).

Different ethnic groups have different opportunities to assert the desired ethnic identities and images they want to be associated with (Song, 2001; Waters, 1996). As a result, individuals self-declared ethnic identification might be different from how they

⁸ Ethnic identity reflects how individuals privately categorize themselves into ethnic groups, whereas ethnic identification captures how they identify their ethnic belonging publicly to others (Saperstein and Penner, 2012).

are classified by others (Csepeli and Simon, 2004; Ladányi and Szelényi, 2006; Telles, 2002; Telles and Lim, 1998). Moreover, different people might classify the same person into different ethnic categories. Harris (1970) and Telles and Paschel (2014) refer to this phenomenon as referential ambiguity of ethnic and racial categories. Categorical ambiguity, on the other hand, describes the lack of consensus about the boundaries that separate these categories (Barth, 1969; Harris, 1970; Telles and Paschel, 2014; Wimmer, 2008).

Self-categorization of minority respondents may also change over time because of temporal shifts in ethnic identification or depending on the situation, context, or surrounding social environment (Eschbach and Gómez, 1998; Harris and Sim, 2002; Hitlin et al., 2006; Ladányi and Szelényi, 2006). Telles and Paschel (2014) identify these kinds of ethnic or racial fluidity as temporal and situational/contextual fluidity, respectively. In different social contexts, different aspects of identity may be asserted (Csizmadia et al., 2012). As some studies pointed out neighbourhood, family, and peers might influence self-reports of race and ethnicity (Harris and Sim, 2002; Herman, 2004; Lubbers et al., 2007; McFarland and Pals, 2005). The actual or perceived level of prejudice and discrimination towards minority people also affects minority group members' inclination to openly identify themselves with a certain ethnic group (Ladányi and Szelényi, 2006).

Members of minorities may often have multiple identities or attachment to different ethnic or racial groups (Brunsma, 2005; Csizmadia et al., 2012; Doyle and Kao, 2007; Hitlin et al., 2006; Ladányi and Szelényi, 2010; Quillian and Redd, 2009). Many Hungarian Roma also tend to declare both Roma and Hungarian identities if multiple choices are allowed (Kertesi and Kézdi, 2011). According to the population census, the reported number of Roma population increased from around 205 000 to around 315 000 between 2001 and 2011⁹ (Hungarian Central Statistical Office, 2011), and a part of this growth can be probably explained by the practice that in 2011, as opposed to 2001,

⁹ In the Hungarian census, answering the questions about nationality, languages, and religion is not compulsory. Therefore, the number of Roma population calculated based on the census can be viewed as the minimum number of Roma in the Hungarian population.

people were allowed to indicate two ethnic groups they felt they belonged to. Moreover, Simonovits and Kézdi (2014) found in an analysis of a six-wave panel dataset that adolescents who identified themselves as Roma in at least once during the research also reported being Hungarian in at least one of the survey waves.

3.2.2. Socio-economic Status and Ethnic Classification

The purpose of this chapter is to examine the characteristics upon which individuals are classified as Roma by their peers. People's perceptions of others' ethnicity may depend on physical characteristics, but several other factors such as language use, lifestyle, residence, family name, social position, or social status also play a significant role in classifying others as members of certain ethnic groups (Csepeli and Simon, 2004; Telles, 2002; Telles and Paschel, 2014). Similarly, ethnic self-identification might also be influenced by these factors.

In Brazil, a country with especially ambiguous racial boundaries, for instance, researchers argued that upwardly mobile individuals or families managed to 'whiten' themselves by avoiding the identification as black (Harris, 1956). Recent research, however, shows more diverse associations between social status and racial self-identification in different Latin-American countries. Telles and Paschel (2014) found that more affluent individuals tended to whiten or darken themselves instead of choosing a mixed-race category in Brazil, tended to identify with darker categories in the Dominican Republic, tended to categorize as mestizo in Colombia, while social status had no effect on racial identification in Panama. Survey interviewers, however, were more likely to 'whiten' higher educated people who self-identified as brown (Telles, 2002), and to 'whiten' people with a higher income (Telles and Lim, 1998). In another study, non-white Brazilian parents having higher education were more likely to classify their children as white than non-white parents having lower education (Schwartzman, 2007).

In the United States, people living in poverty, and having been unemployed or incarcerated were more likely to be classified as well as to identify themselves as black and were less likely to be classified and to identify themselves as white, regardless of how they were categorised by themselves and by others previously (Penner and

Saperstein, 2008; Saperstein and Penner, 2012). Moreover, experiments demonstrated that being dressed as a low-status person increased the likelihood of being classified as black, whereas being dressed as a high-status person increased the likelihood of being classified as white. This association became stronger when racially more ambiguous faces were shown (Freeman et al., 2011).

Empirical findings with regard to the association between social status and Roma ethnic identification are also controversial. Among adolescents in Hungary, Simonovits and Kézdi (2014) found that children of mixed-ethnic families were more likely to identify themselves as Roma if they experienced poverty than adolescents in better-off families. On the contrary, Prieto-Flores (2009) argued based on data from four Central and Eastern European countries that people having higher income were more likely to identify themselves as Roma than those who had lower incomes.

Being classified as Roma by others, however, seems to be positively associated with low socio-economic status. Individuals living in poverty are more likely to be classified as Roma than high-status individuals (Csepeli and Simon, 2004). Therefore, Roma people who are more similar to the majority middle class society may avoid to be classified as Roma (Ladányi and Szelényi, 2006). Thus, we hypothesize that *students who live under better socio-economic circumstances are less likely to be classified as Roma by their peers than students living under worse socio-economic conditions (Hypothesis 1).*

3.2.3. Social Networks and Ethnic Classification

While social identity theory views categories as social context that can affect individuals' identity selection, *identity theory* (Burke, 1991; Stryker and Serpe, 1982) identifies social networks as driving factors of identity change (McFarland and Pals, 2005). Identity theory rests on the assumption that one's identities consist of a collection of role identities that emerge from the membership in different groups or roles (Stets and Burke, 2000). Particular network contexts influence the salience of various identities constituting the self and motivate identity change depending on the salience of those identities to the actual context (Stryker and Burke, 2000).

McFarland and Pals (2005) indeed found that network relations played a crucial role in identity development of adolescents. Munniksma et al. (2015) suggested that there is a bidirectional relationship between interethnic friendships and host society identification among immigrants. Other empirical studies have also revealed a positive association between interethnic friendships and national identification of immigrants (Agirdag et al., 2011; Leszczensky, 2013; Lubbers et al., 2007; Sabatier, 2008).

Social ties, however, not only influence ethnic identity but might have an effect on classification as well. People having Roma friends might be considered members of the Roma group, therefore, they might be more likely to be classified as Roma by others than people without or with fewer Roma friends. Boda (2015) analysing the same dataset we use in this thesis indeed found that students who are popular among their Roma peers are likely to be perceived as Roma by their classmates. Students having a central position among non-Roma peers are likely to be perceived as non-Roma. Students sending unreciprocated friendship ties towards Roma classmates, in contrast, are likely to be perceived as Roma. We expect thus that *students having more Roma friends in the class are more likely to be classified as Roma by their peers than students having fewer Roma friends in the class (Hypothesis 2).*

3.2.4. Academic Achievement and Ethnic Classification

In Hungary, there is a significant gap between the Roma and non-Roma population in terms of education (Kertesi and Kézdi, 2011). Roma children are more likely not to enter secondary education at all, or to choose vocational schools, and are less likely to choose secondary technical or grammar schools than non-Roma children. Furthermore, the dropout rate of Roma students in secondary education is considerably higher, than that of non-Roma youths (Havas and Liskó, 2006; Kertesi and Kézdi, 2009b). Based on data of the Hungarian National Assessment of Basic Competences in 2006, the average test score of Roma eight graders is approximately one standard deviation below the average of non-Roma eight graders for both reading and mathematical literacy skills. These differences, however, can be explained almost entirely by measures of health, parenting, parental education, family income, and the differences in access to high-quality education (Kertesi and Kézdi, 2011).

In the United States, some researchers argued that the oppositional culture of black students partly explain the gap between the achievement of black and white students (Farkas et al., 2002; Fordham and Ogbu, 1986; Mickelson, 1990; Ogbu, 1978). The phenomenon of oppositional culture was described by Ogbu and his colleagues (Fordham and Ogbu, 1986; Ogbu, 1978) who stated that members of involuntary minorities (such as blacks in the United States) experience limited social and economic opportunities compared to whites and members of voluntary minorities. Realizing that their academic efforts are less rewarding, blacks develop oppositional attitudes towards schooling.

Another element of the oppositional culture explanation is that academically successful black students are considered to be ‘acting white’ by black peers, and are accused of wanting to meet the expectations of the white society¹⁰ (Fordham and Ogbu, 1986). Similar mechanisms, however, have been described in other countries (De Vos and Wagatsuma, 1966; Willis, 1977), and among other communities in the US (Fryer Jr. and Torelli, 2010; Gans, 1962) as well. Fryer and Torelli (2010) found in their study that acting white taunts are not present in segregated schools attended exclusively by blacks but are prevalent in integrated schools, where successful black students are more likely to be sanctioned by their black peers, because high academic achievement is labelled as outgroup behaviour.

Although several empirical studies have challenged the key assumptions and predictions of the oppositional culture explanation and the acting white hypothesis (Ainsworth-Darnell and Downey, 1998; Downey, 2008; Harris, 2011; Horvat and Lewis, 2003; Tyson et al., 2005), other studies show that teachers tend to attribute the black-white achievement gap to students’ characteristics (Bol and Berry, 2005; Downey and Pribesh, 2004; Ferguson, 2003) and this view is also pervasive in the society (Harris,

¹⁰ The issue of ‘acting white’ has received considerable attention among both researchers and the press. It appeared, for instance, in US Senator Barack Obama’s keynote address to the Democratic National Convention in 2004: „Go into any inner city neighborhood, and folks will tell you that government alone can’t teach kids to learn. They know that parents have to parent, that children can’t achieve unless we raise their expectations and turn off the television sets and eradicate the slander that says a black youth with a book is acting white” (cited by Fryer Jr. and Torelli, 2010).

2011). Some signs of the phenomenon that Roma students are also perceived to have lower academic achievement was described by Feischmidt (2014)¹¹. As long as these perceptions exist, academic achievement might be associated with ethnic classification. Roma students might be considered to have lower academic achievement than non-Roma students, but causality might also be reversed. Students with higher academic achievement might be less likely to be classified as Roma.

With regard to ethnic self-identification, Wilkinson (2010) indeed found that instead of the causal order suggested by the acting white hypothesis, non-minority adolescents with low school performance tended to identify themselves with a marginalized (in this case Latino) social category in school. Wilkinson suggests that this phenomenon indicates that Latino identity might be associated with poor performance among adolescents. Similarly, we argue that Roma ethnicity is associated with low school performance in Hungary. Therefore, we expect that underachieving students are more likely to be perceived as Roma than students with high school performance.

In our dataset, data on students' grades are only available for a small subsample and only for later waves. Therefore, we cannot examine the school performance of Roma and non-Roma students expressed by grades, whether Roma students express oppositional attitudes toward education, or whether high achieving Roma students are accused of acting white. There are variables, however, that can be used to measure classmates' and teachers' perceptions about students' academic abilities and achievement. Therefore, we are able to study the associations between ethnic classification and perceptions of academic abilities and achievement. We hypothesize that *students who are perceived by peers and teachers as having better academic abilities and achievement are less likely to be classified as Roma by their classmates than students perceived as having lower academic abilities and achievement (Hypothesis 3).*

¹¹ She cites a Slovak Roma boy who said: "*Whites want to learn, they want to get something, most of them. They care about school. But this is a Roma character. They do not learn. This is their worst character*" (Feischmidt, 2014 p. 122.).

3.3. DATA AND METHOD

3.3.1. Participants

We analysed the first- and second-wave data of a subsample of the RECENS dataset described in Chapter 2. First wave data were gathered in the autumn of 2010, a few weeks after the beginning of the academic year. As this was the students' first year in their secondary school, they had limited opportunity to get to know each other by this time. Second wave data were gathered half a year later, in the spring of 2011. In the third and fourth wave, the number of Roma students dropped dramatically; therefore, we restricted the investigation to the first two waves of the research.

We selected classrooms where, in both waves, the response rate reached 70%, and at least three self-declared Roma students attended the class. Thus, our subsample comprised 23 classrooms with a mean class size of 32 ($SD=3.16$), and 33 students ($SD=4.09$) in wave 1 and 2, respectively. Eleven classes provided vocational education, which does not provide the possibility to enter tertiary education in Hungary. Ten classes were technical school classes, and two classes provided the highest level of secondary education as they were grammar school classes. In the first wave, 270 boys (36.2%) and 476 girls (63.8%), and, in the second wave, 281 boys (36.5%) and 489 girls (63.5%) attended these classes. In the two waves, 34.6% and 35.6% of the students reported being either Roma or both Roma and Hungarian. In the regression analyses, only those students were included who gave valid answers to the questions on every dependent and independent variables, or whose answers could be imputed based on other waves (see Section 3.3.1. about imputation). Thus, the final subsample comprised 629 students.

3.3.1. Measures

Dependent variable: Roma classification by peers. In both waves, students were provided a list of all classmates and were asked to nominate who they consider Roma. From the answers we created a measure of Roma classification by peers with scores ranging from 0 to 1 by calculating the proportion of classmates who classified the respondent as Roma. First, we calculated the indegree for each student by summing the received nominations from others. Second, we divided the indegrees by the number of

classmates in order to take into account the differences in the sizes of the classes. We used the first wave values of this Roma classification measure as the dependent variable in our cross-sectional analyses in T1, and the second wave values as the dependent variable in our dynamic models and in the cross-sectional models in T2. Figure 1 illustrates the distribution of the Roma classification score among different ethnic groups based on self-declaration.

Socio-economic status. We included two measurements of students' socio-economic background, mother's highest education and whether the student belongs to the 'socially disadvantaged' category¹² in our analysis. Mother's highest education was measured with 7 categories: 1. fewer than 8 years of primary school, 2. primary school, 3. vocational school, 4. secondary technical school, 5. secondary grammar school, 6. college (BA), and 7. university (MA). We recoded the values of this variable into 4 categories: 1. 8 classes of primary school or lower, 2. vocational school, 3. finished secondary education, and 4. finished tertiary education. The categories of mother's highest education were included as dummy variables with the primary school as the reference category in the regression models. Missing data on mother's education were imputed, using data from the other waves.

The disadvantaged socio-economic status of the students was identified, using teacher reports. Teachers were asked to nominate students who belonged to the 'socially disadvantaged' category based on both the Hungarian legislation and in their own opinion. Thus, teachers were allowed not only to nominate students who fitted into the legal category but express their own knowledge about the socio-economic status of their students. Students who were nominated as socially disadvantaged were coded as 1, students not belonging to this category were coded as 0.

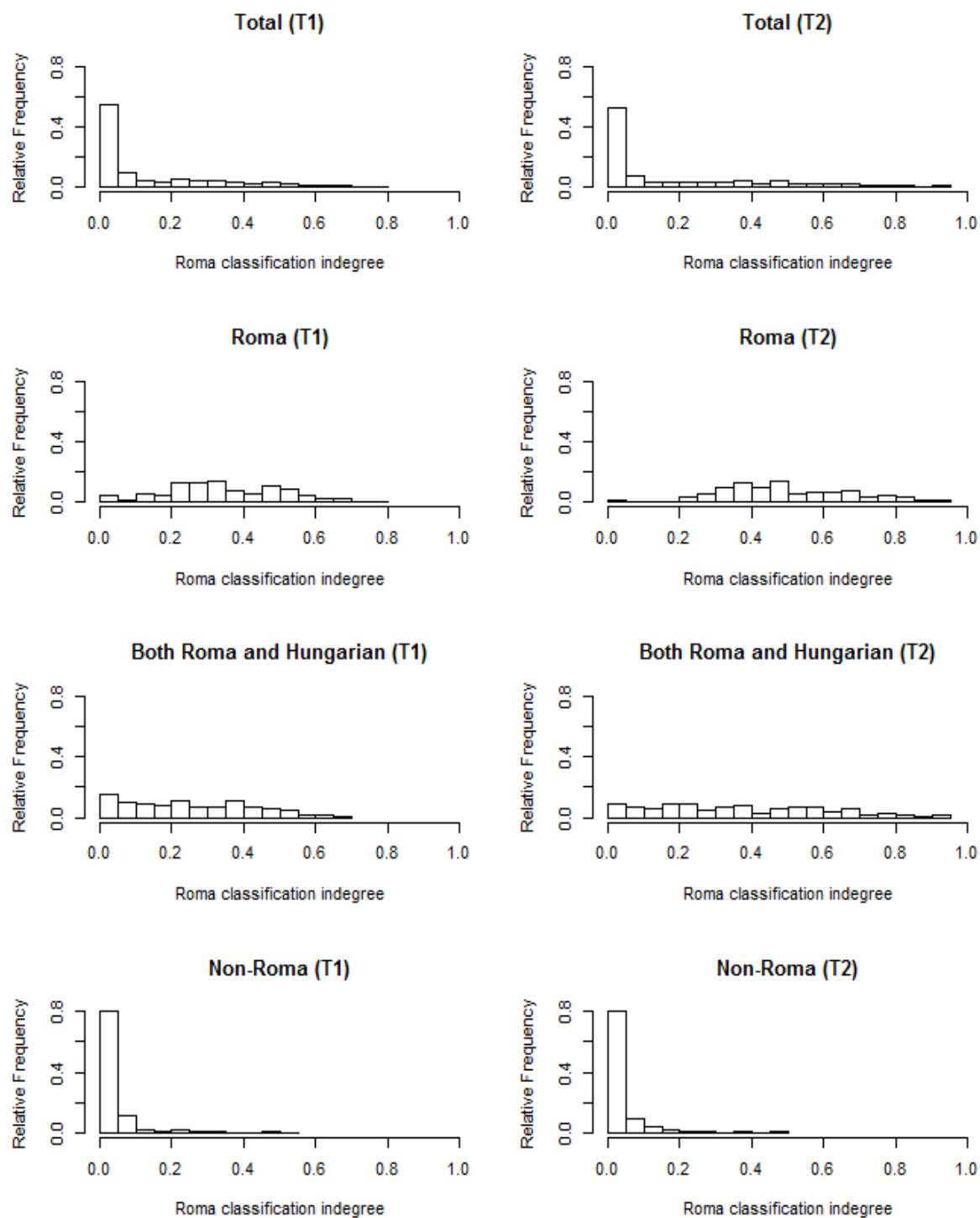
¹² According to the Hungarian regulations (Act LXXIX of 1993 on Education) children were socially disadvantaged at the time of the data collection if they were entitled to get regular child protection allowance based on their family background and social circumstances.

Table 3. Descriptive statistics of the subsample of Chapter 3

Class ID	School type	Type of settlement	N (T1)	N (T2)	Number of Roma only (T1)	Number of Roma only (T2)	Number of Roma and Hungarian (T1)	Number of Roma and Hungarian (T2)	Number of Roma (T1)*	Number of Roma (T2)*	Number of girls (T1)	Number of girls (T2)
2000	Vocational	Large town	29	29	14	14	5	5	19	19	15	16
2100	Technical	Large town	27	27	6	8	9	6	15	14	23	24
2200	Technical	Large town	31	28	12	10	3	3	15	13	22	21
2300	Technical	Large town	30	30	8	9	4	4	12	13	16	16
2400	Technical	Large town	29	32	5	5	1	5	6	10	18	20
2500	Vocational	Large town	35	40	10	11	8	6	18	17	17	18
2800	Vocational	Large town	32	34	11	10	8	11	19	21	21	22
2900	Vocational	Large town	31	36	8	8	3	9	11	17	19	22
3200	Grammar	Midlde-sized town 1	34	35	2	1	2	2	4	3	26	27
3300	Technical	Midlde-sized town 1	37	38	2	6	6	5	8	11	2	2
3400	Grammar	Midlde-sized town 1	36	37	0	0	4	4	4	4	14	14
3700	Vocational	Midlde-sized town 1	37	40	15	17	6	5	21	22	32	33
4400	Technical	Midlde-sized town 2	38	38	2	2	5	7	7	9	30	30
5100	Vocational	Midlde-sized town 2	33	35	5	5	5	5	10	10	26	27
5200	Vocational	Midlde-sized town 2	26	25	9	9	4	3	13	12	0	0
5400	Technical	Midlde-sized town 2	35	38	3	4	6	5	9	9	18	18
5600	Vocational	Midlde-sized town 2	31	31	10	13	10	8	20	21	31	31
7100	Technical	Capital	32	32	3	4	4	4	7	8	24	24
7300	Technical	Capital	31	32	5	3	2	3	7	6	20	21
7400	Technical	Capital	33	34	2	3	3	3	5	6	27	28
7600	Vocational	Capital	33	33	1	2	8	7	9	9	28	28
7700	Vocational	Capital	31	31	4	5	6	5	10	10	23	23
7800	Vocational	Capital	35	35	3	2	6	8	9	10	24	24
Total			746	770	140	151	118	123	258	274	476	489

* Number of Roma students was calculated summing the number of self-reported 'both Roma and Hungarian', and 'Roma' students.

Figure 1. The distribution of the scores on Roma classification among different ethnic groups based on self-declaration in T1 and T2



The number of Roma friends in the class. Students were asked to evaluate their relationships to all other classmates. Positive and negative relations were measured on a scale ranging from -2 to 2, where -2 represented '*I hate him/her*', -1 indicated '*I do not like him/her*', 0 referred to '*He/she is neutral to me*', 1 indicated '*I like him/her*' and 2 represented '*He/she is my friend*'. 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*. For every student, we summed the outgoing nominations (outdegrees) toward self-declared Roma classmates.

Perceptions of academic abilities and achievement. Students were provided a list of all classmates and were asked to nominate whom they consider '*clever and smart*', and '*having good grades*'. From the answers we created two proxy measures of peer perceptions of academic abilities and achievement with scores ranging from 0 to 1, by calculating the proportion of classmates who nominated the respondent as clever and smart, or having good grades, respectively. First, we calculated the indegree for each student by summing the received nominations from others. Second, we divided the indegrees by the number of classmates to take into account the differences in the sizes of the classes. Figures 2 and 3 illustrate the distribution of the scores on peer perception of cleverness, and on having good grades, respectively, among different ethnic groups based on self-declaration. Peer perceptions of having good grades were only measured in the first wave.

Teachers were also asked to nominate students they considered '*clever and smart*', '*hardworking*', '*helping others in achieving better academic progress*', and '*hampering others in academic progress*'. For each item, students who were nominated were coded as 1, students not mentioned were coded as 0.

Control variables. In both the cross-sectional and dynamic models, we controlled for self-declared ethnicity of students. Students were asked to classify themselves as '*Hungarian*', '*Roma*', '*both Hungarian and Roma*', or members of '*another ethnicity*'. We recoded students belonging to the '*Hungarian*' or '*other ethnicity*' as non-Roma. The Roma and both Roma and Hungarian categories were not changed. The categories of self-declared ethnicity were included as dummy variables with non-Roma being the reference category in the regression models. Missing data on students' ethnicity were

imputed, using data from the other waves¹³. We also controlled for students' gender and whether students were honoured in school according to the teacher reports. In the dynamic models, we controlled for the proportion of classmates who classified the respondent as Roma in T1, since we wanted to examine the associations between our independent variables and the change in ethnic classification.

¹³ Although some changes in self-reports of ethnic identification occurred between the different waves (11.8%, 7.0%, and 2.9% between the consecutive waves, respectively), ethnic self-identification reported in other waves is statistically the best predictor of ethnic identification of students.

Figure 2. The distribution of the scores on peer perception of cleverness among different ethnic groups based on self-declaration in T1 and T2

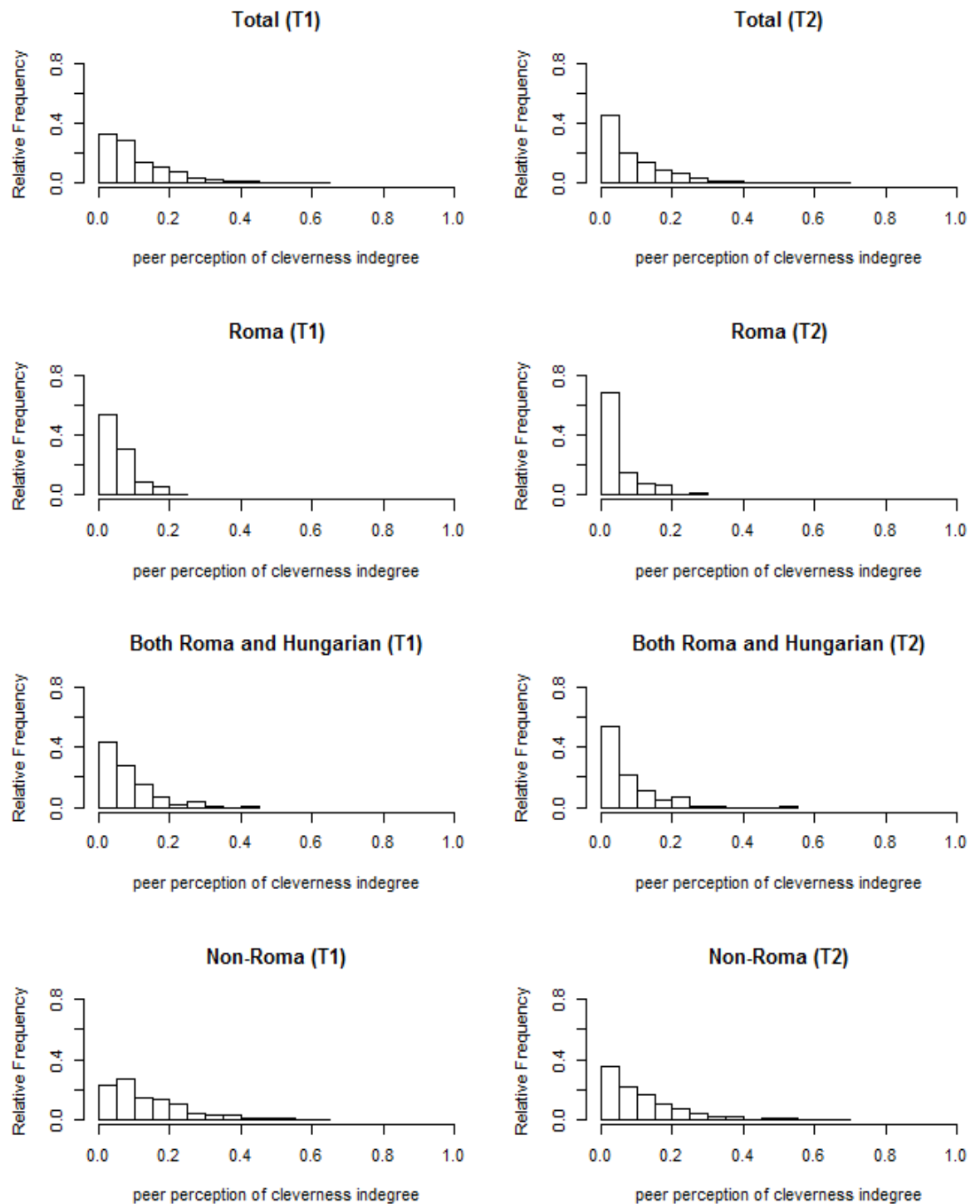
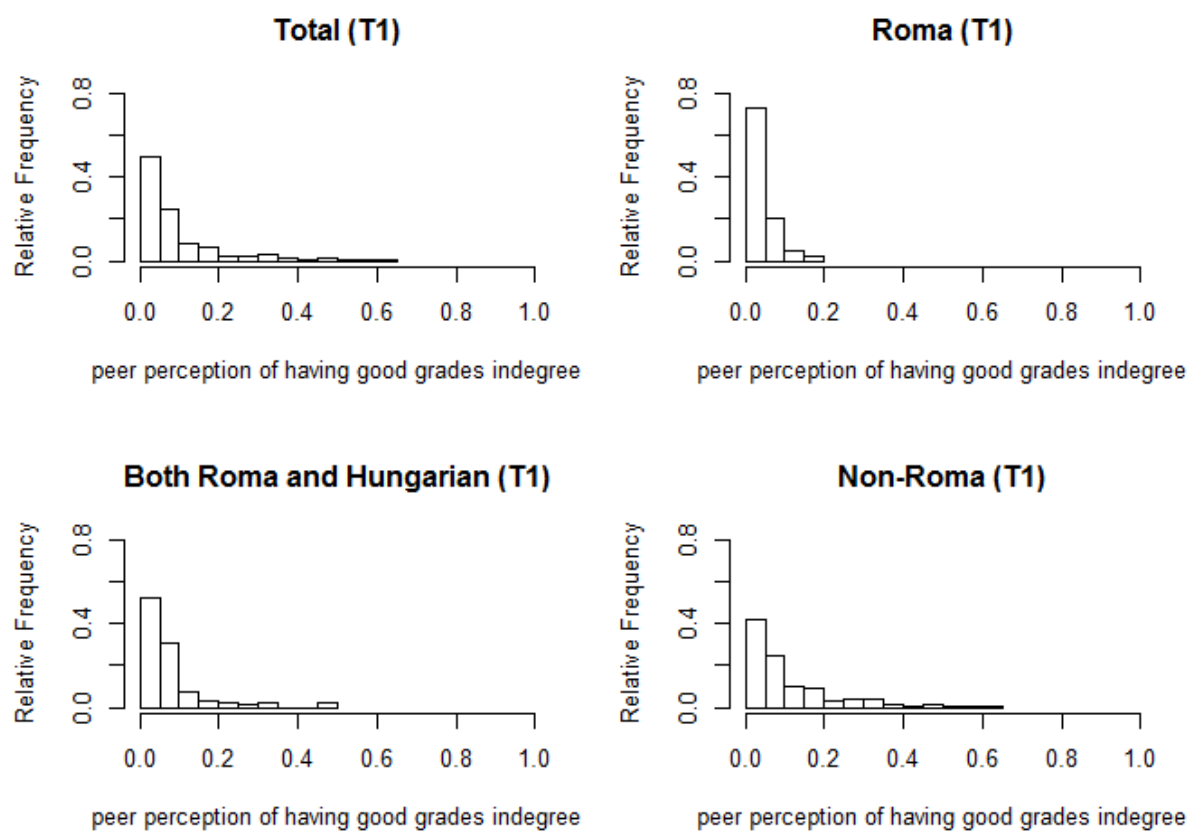


Figure 3. The distribution of the scores on peer perception of having good grades among different ethnic groups based on self-declaration in T1



Note: this question was only included in the first-wave questionnaire

3.3.2. Analytical Strategy

As in our hierarchical dataset students are nested in classrooms, multilevel analysis would be a reasonable solution to handle the non-independence of the observational units (Snijders and Bosker, 1999). Our dependent variable, the proportion of classmates who classified the respondent as Roma, however, is bounded between 0 and 1. Linear models are not able to guarantee that the predicted values of the dependent variable are restricted between 0 and 1. Moreover, we cannot assume that the effect of any particular independent variable is constant throughout its range. (Papke and Wooldridge, 1996; Ramalho et al., 2011). Thus, we cannot apply multilevel linear models to analyse our data.

The Tobit model (Tobin, 1958) is relatively commonly used among researchers to deal with data censored at zero (Smith and Brame, 2003). Tobit regression, however, can be used with censored or partially unobserved dependent variables and strictly requires normality and homoscedasticity of the dependent variable prior to censoring (Maddala, 1991). In our case, the dependent variable has been calculated as a proportion based on binary choices of the classmates, and it is defined to be in the interval from 0 to 1. The assumption that our dependent variable is censored or partially unobserved does therefore not hold in this study. Moreover, the distribution of our dependent variable violates the assumption of normality and observations at zero occur with large frequency.

Considering the above-mentioned problems with multilevel linear and Tobit models, we tested our hypotheses applying fractional regression analysis (Papke and Wooldridge, 1996; Ramalho et al., 2011) with robust cluster variance estimator, which reports standard errors that adjust for clustering of students within classrooms. Fractional regression models are appropriate when the dependent variable is measured as a proportion, and it takes values between 0 and 1 or may also be equal to 0 or 1 (Papke and Wooldridge, 1996; Ramalho et al., 2011).

We estimated our regression models using the R package ‘frm’ (Ramalho, 2015). ‘Frm’ estimates the parameters, using Bernoulli-based quasi-maximum likelihood estimation to provide consistent parameter estimates without requiring distributional assumptions.

The most important information that needs to be known is the correct specification of the conditional mean of the dependent variable. We estimated a one-part model instead of a two-part model (Ramalho et al., 2011) because zero values of the dependent variables can be attributed to the same mechanism than values higher than zeros, being calculated as an aggregation of classmates' perceptions of ethnicity. 'Frm' provides an R-squared measure that is calculated as the square of the correlation coefficient between observed and fitted values of the dependent variable (Ramalho, 2015).

The 'frm' R package allows five types of link functions (logit, probit, cauchit, loglog, and complementary loglog) for the fractional regression model. Similarly to generalized linear models, the link function can be defined as a function that relates the linear predictors to the mean of the dependent variable (Ramalho et al., 2011). Based on P tests that allow to test against each other alternative specifications for the link function (Davidson and MacKinnon, 1981; Ramalho et al., 2011), we decided to use the loglog specification for our models. Robustness checks with other types of link functions, however, were conducted in the case of our dynamic models (see Section 3.4.3. and 3.6. Appendix).

First, we conducted cross-sectional analyses based on the first- and second-wave data separately. These analyses show the partial associations between ethnic classification and the independent variables at the beginning of secondary education and half a year later. The parameters estimated based on the first-wave data might represent the associations between social status, social ties, perceptions of students' academic achievement and abilities, on the one hand, and ethnic classifications on the other hand based on the first impressions of students a few weeks after getting to know each other. The parameters estimated based on the second-wave data show whether or not these associations differ half a year later, when students learnt much more about each other.

Second, we conducted a longitudinal analysis based on the first two waves of the dataset. To better understand changes in ethnic classification over time, we explained the second-wave values of the Roma classification score by taking into account the first-wave values of the independent variables, also controlling for the first-wave values of Roma classification (for a similar methodological approach, see Martinovic et al., 2009).

3.4. RESULTS

3.4.1. Descriptive Analysis

Tables 4 and 5 summarize the descriptive statistics of the dependent and independent variables, and the associations between these variables and self-declared ethnicity of the students in the two waves. In the second wave, no completed teacher's questionnaires from 11 form-masters are available. Descriptive statistics of teacher-reported variables are therefore calculated for 12 classrooms (N=308).

The tables show that some students tended to change their self-declared ethnic identification between the two waves. Compared to the first wave, more students identified themselves as Roma or Roma and Hungarian instead of reporting being non-Roma in the second wave. In both waves, the proportion of boys is higher among the non-Roma than among the Roma and Roma and Hungarian groups.

In both waves, self-declared Roma students and students with both Roma and Hungarian ethnic identification are classified as Roma by a higher proportion of their classmates than non-Roma students. On average, Roma students and students with dual ethnic identification send more outgoing friendship nominations towards other Roma students than non-Roma students. Both Roma students and students with dual identification are perceived by a lower proportion of classmates as clever and smart and having good grades than non-Roma students.

According to teacher reports, a lower proportion of Roma students and students with dual identification are perceived as hardworking, helping others in achieving better academic progress, and having good grades than non-Roma students. Moreover, Roma students were honoured less frequently than non-Roma students. They are, however, more often perceived as hampering others than their non-Roma classmates.

Table 4. Descriptive statistics of the dependent and independent variables in wave 1 among different ethnic groups (based on self-declared ethnicity of students)

T1	Non-Roma	Roma	Roma and Hungarian	Total
N	401	121	107	629
boy	40.9%	33.9%	32.7%	38.2%
Roma classification by peers (standardized indegree)				
mean	0.03	0.35	0.25	0.13
SD	0.08	0.17	0.18	0.18
minimum	0.00	0.00	0.00	0.00
maximum	0.53	0.77	0.70	0.77
number of Roma friends in the class				
mean	1.1	3.8	2.8	1.9
SD	1.8	3.8	2.9	2.7
minimum	0	0	0	0
maximum	13	18	18	18
peer perception of cleverness (standardized indegree)				
mean	0.13	0.05	0.08	0.11
SD	0.11	0.05	0.08	0.10
minimum	0.00	0.00	0.00	0.00
maximum	0.63	0.21	0.42	0.63
peer perception of having good grades (standardized indegree)				
mean	0.10	0.04	0.07	0.08
SD	0.12	0.04	0.09	0.11
minimum	0.00	0.00	0.00	0.00
maximum	0.63	0.17	0.47	0.63
teacher's perception: clever, smart	33.7%	14.9%	20.6%	27.8%
teacher's perception: hardworking	33.9%	10.7%	19.6%	27.0%
teacher's perception: helps others in achieving better academic progress	17.2%	5.8%	13.1%	14.3%
teacher's perception: hampers others in academic progress	7.7%	16.5%	10.3%	9.9%
was honoured	24.4%	13.2%	14.0%	20.5%
mother's education				
primary school or lower	20.9%	79.3%	63.6%	39.4%
vocational school	40.4%	13.2%	26.2%	32.8%
secondary education	27.7%	6.6%	7.5%	20.2%
tertiary education	11.0%	0.8%	2.8%	7.6%
socially disadvantaged	26.7%	62.8%	54.2%	38.3%

Note: Kruskal-Wallis tests showed statistically significant differences between the three ethnic groups for all ordinal and continuous variables ($p < 0.001$). Chi-squared tests showed statistically significant differences between the three ethnic groups for all nominal variables ($p < 0.05$) except for gender.

Table 5. Descriptive statistics of the dependent and independent variables in wave 2 among different ethnic groups (based on self-declared ethnicity of students)

T2	Non-Roma	Roma	Roma and Hungarian	Total
N	392	128	109	629
boy	40.8%	34.4%	33.0%	38.2%
Roma classification by peers (standardized indegree)				
mean	0.04	0.50	0.37	0.19
SD	0.08	0.19	0.24	0.25
minimum	0.00	0.00	0.00	0.00
maximum	0.50	0.92	0.92	0.92
number of Roma friends in the class				
mean	1.0	2.4	2.3	1.5
SD	1.5	2.4	2.5	2.1
minimum	0	0	0	0
maximum	8	9	10	10
peer perception of cleverness (standardized indegree)				
mean	0.11	0.04	0.07	0.09
SD	0.11	0.06	0.08	0.10
minimum	0.00	0.00	0.00	0.00
maximum	0.68	0.28	0.51	0.68
teacher's perception: clever, smart*	33.9%	10.1%	21.4%	26.3%
teacher's perception: hardworking*	26.2%	7.2%	19.6%	20.8%
teacher's perception: helps others in achieving better academic progress*	15.3%	0.0%	1.8%	9.4%
teacher's perception: hampers others in academic progress*	15.3%	27.5%	25.0%	19.8%
was honoured*	28.4%	17.4%	28.6%	26.0%
mother's education				
primary school or less	21.9%	82.8%	58.7%	40.7%
vocational school	39.0%	11.7%	29.4%	31.8%
secondary education	28.1%	5.5%	9.2%	20.2%
tertiary education	11.0%	0.0%	2.8%	7.3%
socially disadvantaged*	25.5%	64.8%	57.8%	39.1%

Note: Kruskal-Wallis tests showed statistically significant differences between the three ethnic groups for all ordinal and continuous variables ($p < 0.001$). Chi-squared tests showed statistically significant differences between the three ethnic groups for nominal variables ($p < 0.001$) except for gender, hampers others in academic progress, and was honoured in school.

*In the second wave, no completed teacher's questionnaires from 11 form-masters are available. Descriptive statistics of teacher-reported variables were therefore calculated for 12 classrooms ($N=308$). Besides, we do not have data on peer perception of having good grades in the second wave.

On average, mother's highest education is lower in the case of Roma pupils than in the case of non-Roma students and students with dual ethnic identification. Moreover, Roma students more often belong to the socially disadvantaged category according to teacher reports than their classmates. Thus, indicators of socio-economic status suggest that Roma students live under the worst socio-economic conditions and non-Roma students live under the best circumstances in our subsample. As we do not have completed teacher's questionnaire from 11 form-masters in the second wave, values of teacher-reported variables (teachers' perceptions of students' characteristics and the proportion of socio-economically disadvantaged students) are not directly comparable in the two waves.

Table 6 shows correlations between the first and second wave values of Roma classification by peers and peer perceptions of cleverness and having good grades. The strong but not perfect positive correlation ($r=0.895$, $p<0.01$) between Roma classification in wave 1 and 2 suggests that classification by peers slightly changed from the first to the second wave. Compared to Roma classification, peer perceptions of cleverness changed more between the two waves ($r=0.681$, $p<0.01$). There is a significant negative correlation between being classified as Roma by the classmates and being perceived as clever and smart ($r=-0.262$ and $r=-0.293$, $p<0.01$ in T1 and T2, respectively) on the one hand, and being perceived as having good grades ($r=-0.209$, $p<0.01$ in T1) on the other hand. Peer perceptions of cleverness and having good grades, however, strongly correlate with each other ($r=0.804$, $p<0.01$ in T1).

Table 6. Correlations between Roma classification and peer perception of academic abilities (standardized indegrees)

	(1)	(2)	(3)	(4)
(1) Roma classification T1	-			
(2) Roma classification T2	0.895*	-		
(3) peer perception of cleverness T1	-0.262*	-0.311*	-	
(4) peer perception of cleverness T2	-0.266*	-0.293*	0.681*	-
(5) peer perception of having good grades T1	-0.209*	-0.240*	0.804*	0.693*

Note: * correlation is significant at the 0.01 level. We do not have data on peer perception of having good grades in the second wave.

3.4.2. Cross-sectional Fractional Regression Models

Table 7 presents the results of the cross-sectional fractional regression analyses. Models 1-4 are estimated based on the first-wave data, while Models 5-6 are estimated based on the second-wave data. In Model 1, variables measuring the socio-economic status of students, the number of self-declared Roma friends, peer perceptions of cleverness and having good grades, gender, and self-declared ethnicity were included. In Model 2, we also included measures of teachers' perceptions of academic abilities and achievement and whether the student was honoured in school. As peer perception of having good grades was not measured in the second wave, Models 3 and 4 and Models 5 and 6 (for the first and second waves, respectively) estimate the same parameters as Model 1 and 2 without including peer perception of having good grades. These models thus allow us to make comparisons between the results based on first- and second-wave data.

In the second wave, no completed teacher's questionnaires from 11 form-masters are available. The variable measuring the socially disadvantaged status of students, therefore, was imputed for this 11 classrooms with the first-wave data from teacher reports, because social status of most students probably did not change considerably in half a year. The variables measuring teachers' perceptions and whether students were honoured, however, are not constant over time, therefore, these data were not imputed. The parameters in Model 6 were thus estimated based on data from 12 classes (N=308 students).

Table 7. Cross-sectional fractional regression models in T1 and T2

Dependent variable Roma cassification	Model 1 (T1)			Model 2 (T1)			Model 3 (T1)			Model 4 (T1)			Model 5 (T2)			Model 6 (T2)		
	Est.	SE		Est.	SE		Est.	SE		Est.	SE		Est.	SE		Est.	SE	
Intercept	-1.176	0.092	***	-1.183	0.106	***	-1.176	0.091	***	-1.182	0.104	***	-1.026	0.116	***	-0.818	0.136	***
number of Roma friends	0.036	0.010	***	0.037	0.009	***	0.036	0.010	***	0.037	0.009	***	0.033	0.016	*	0.024	0.026	
peer perception of cleverness	-0.554	0.431		-0.539	0.469		-0.501	0.268		-0.580	0.391		-0.986	0.433	*	-1.254	0.611	*
peer perception of having good grades	0.067	0.353		-0.056	0.373													
mother's education																		
vocational school	-0.135	0.037	***	-0.127	0.037	***	-0.135	0.036	***	-0.127	0.037	***	-0.213	0.046	***	-0.285	0.073	***
secondary education	-0.168	0.076	*	-0.172	0.072	*	-0.168	0.076	*	-0.172	0.071	*	-0.252	0.053	***	-0.320	0.086	***
tertiary education	-0.284	0.087	***	-0.275	0.085	***	-0.284	0.087	***	-0.275	0.084	***	-0.411	0.088	***	-0.552	0.138	***
socially disadvantaged	0.224	0.071	**	0.217	0.072	**	0.224	0.071	**	0.217	0.071	**	0.301	0.064	***	0.426	0.097	***
self-declared ethnicity																		
Roma	0.912	0.096	***	0.922	0.098	***	0.911	0.096	***	0.922	0.098	***	1.234	0.114	***	1.216	0.161	***
Roma and Hungarian	0.717	0.073	***	0.729	0.073	***	0.718	0.072	***	0.729	0.072	***	0.966	0.090	***	0.857	0.120	***
boy	0.002	0.078		0.002	0.076		0.002	0.077		0.002	0.076		-0.100	0.066		-0.085	0.055	
teacher's perception																		
clever, smart				0.035	0.069					0.034	0.068					-0.189	0.079	*
hardworking				0.084	0.066					0.082	0.063					-0.122	0.086	
helps others				-0.160	0.107					-0.159	0.108					0.291	0.151	
hampers others in academic progress				-0.040	0.071					-0.040	0.071					-0.003	0.091	
was honoured				-0.001	0.082					-0.001	0.082					-0.048	0.124	
N	629			629			629			629			629			308		
R-squared	0.589			0.593			0.590			0.592			0.710			0.720		

*p<0.05, **p<0.01, ***p<0.001. R^2 is calculated as the square of the correlation coefficient between observed and fitted values of the dependent variable (Ramalho, 2015).

The results of the cross-sectional regression analyses show that in both waves, students having Roma (0.912, $p < 0.001$, Model 1; 0.922, $p < 0.001$, Model 2; 1.234, $p < 0.001$, Model 5) and both Roma and Hungarian (0.717, $p < 0.001$, Model 1; 0.729, $p < 0.001$, Model 2; 0.966, $p < 0.001$, Model 5) ethnic identification are more likely to be classified as Roma by a higher proportion of their peers than non-Roma students. Gender does not have a statistically significant effect on Roma classification.

We expected that students living under better socio-economic circumstances are less likely to be classified as Roma by their peers than students living under worse socio-economic conditions (Hypothesis 1). The results of both waves are in line with this hypothesis. Socially disadvantaged students (0.224, $p < 0.01$, Model 1; 0.217, $p < 0.01$, Model 2; 0.301, $p < 0.001$, Model 5) and students whose mother has lower education (negative parameters of mother's highest education compared to primary school as the reference category) are more likely to have higher score on Roma classification.

We expected that students having more Roma friends in the class are more likely to be classified as Roma than students having fewer Roma friends (Hypothesis 2). In line with our hypothesis we found that students having more friendship nominations towards self-declared Roma students are more likely to be classified as Roma by a higher proportion of peers in both waves than students having fewer Roma friends (0.036, $p < 0.001$, Model 1; 0.037, $p < 0.001$, Model 2; 0.033, $p < 0.05$, Model 5, although the parameter estimate in Model 6 is not significant based on data from 12 classrooms).

We also hypothesized that students who are perceived by peers and teachers as having better academic abilities and achievement are less likely to be classified as Roma by their classmates than students who are perceived as having lower academic abilities and achievement (Hypothesis 3). In contrast to this hypothesis, none of the variables measuring peers' and teachers' perceptions of academic abilities and achievement is statistically significantly associated with Roma classification in the first wave. In the second wave, however, the more classmates consider someone clever, the fewer classmates classify him or her as Roma (-0.986, $p < 0.05$, Model 5; -1.254, $p < 0.05$, Model 6). Based on data of 12 classes students who are perceived as clever by the teacher are classified as Roma by a lower proportion of peers than students not perceived as clever (-0.189, $p < 0.05$, Model 6).

3.4.3. Dynamic Fractional Regression Models

Table 8 presents the results of the longitudinal fractional regression analyses. In both Models 7 and 8, the dependent variable is Roma classification in T2, and we control for Roma classification in T1. Thus, the models explain how the change in the Roma classification score between the two waves is associated with the independent variables. In Model 7, we included variables measuring the socio-economic status of the students, peer perceptions of cleverness and having good grades, gender, and self-declared ethnicity. In Model 8, we also included measures of teachers' perceptions of academic abilities and achievement and whether the student was honoured in school.

Table 8. Dynamic fractional regression models

Dependent variable: Roma classification (T2)	Model 7			Model 8		
	Estimate	SE		Estimate	SE	
Intercept	-1.212	0.100	***	-1.210	0.105	***
Roma classification (T1)	3.041	0.309	***	3.093	0.303	***
number of Roma friends	0.021	0.007	**	0.020	0.007	**
peer perception of cleverness	-1.130	0.349	***	-1.065	0.309	***
peer perception of having good grades	0.313	0.213		0.450	0.220	*
mother's education						
vocational school	-0.076	0.046		-0.069	0.040	
secondary education	-0.116	0.054	*	-0.098	0.050	*
tertiary education	-0.171	0.071	*	-0.188	0.074	*
socially disadvantaged	0.179	0.062	**	0.180	0.058	**
self-declared ethnicity						
Roma	0.440	0.081	***	0.430	0.077	***
Roma and Hungarian	0.484	0.046	***	0.474	0.046	***
boy	-0.080	0.058		-0.091	0.057	
teacher's perception						
clever, smart				-0.210	0.057	***
hardworking				0.076	0.050	
helps others in achieving better academic progress				0.174	0.061	**
hampers others in academic progress				0.132	0.086	
was honoured				-0.165	0.051	***
N	629			629		
R-squared	0.861			0.869		

*p<0.05, **p<0.01, ***p<0.001. R² is calculated as the square of the correlation coefficient between observed and fitted values of the dependent variable (Ramalho, 2015).

The results show that students having Roma (0.440, $p < 0.001$, Model 7; 0.430, $p < 0.001$, Model 8) and both Roma and Hungarian (0.484, $p < 0.001$, Model 7; 0.474, $p < 0.001$, Model 8) ethnic identification are more likely to have higher scores on Roma classification over time than non-Roma students. Being classified as Roma in the first wave is also strongly associated with being classified as Roma in the second wave (3.041, $p < 0.001$, Model 7; 3.093, $p < 0.001$, Model 8). Gender does not have a statistically significant effect on the change in Roma classification.

The results of both Models 7 and 8 are in line with the first hypothesis. Socially disadvantaged students (0.179, $p < 0.01$, Model 7; 0.180, $p < 0.01$, Model 8) and students whose mother has lower education (negative parameters of mother's highest education compared to primary school as the reference category, however, the effect of vocational school is statistically not significant) are more likely to have a higher score on Roma classification over time, even after controlling for self-declared ethnicity.

In line with our second hypothesis we found that students having more friendship nominations towards self-declared Roma students in the first wave are more likely to be classified as Roma by a higher proportion of classmates over time than students having fewer Roma friends (0.021, $p < 0.01$, Model 7; 0.020, $p < 0.01$, Model 8).

The results are partially in line with our third hypothesis. Students with a higher score on peer perception of cleverness in T1 have a lower score on Roma classification over time, even after controlling for self-declared ethnicity (-1.130, $p < 0.001$, Model 7; -1.065, $p < 0.001$, Model 8). Peer perception of having good grades in T1 does not have a significant effect on the change in Roma classification in Model 7. In Model 8, however, it shows a significant positive association with the change in Roma classification (0.450, $p < 0.05$).

In Model 8, we included teacher-reported variables connected to academic abilities and achievement of pupils. Students who are considered clever and smart by the teacher (-0.210, $p < 0.001$) or were honoured in school (-0.165, $p < 0.001$) have lower scores on Roma classification over time. Helping others in achieving better academic progress according to teachers, however, shows a significant positive association with the change in Roma classification (0.174, $p < 0.01$). Being hardworking and hampering others in

academic progress do not have statistically significant effects on the changes in peer classification in our models.

The parameters in Tables 7 and 8 show the sign and significance of the regression coefficients. The magnitude of the effects is difficult to interpret, however, because the effects of the independent variables on the dependent variable are not constant. Therefore, we computed average partial effects (also called average marginal effects), which describe the mean partial effects of the independent variables for the population of students in our sample. Average partial effects for the cross-sectional and dynamic models are presented in the Section 3.6. Appendix, in Tables 9 and 10, respectively.

3.4.4. Robustness checks

We operationalized the number of Roma friends with the number of outgoing friendship nominations towards Roma classmates in the analysis. It is possible, however, that the proportion of Roma peers among one's friends is considered more important in the classification process than the raw number of them. Moreover, not only the outgoing nominations towards Roma peers, but the incoming friendship nominations from Roma classmates may play a role in classification. The findings might thus be sensitive to the operationalization of the variable measuring the number of Roma friends. To check the robustness of the results, we run Models 7 and 8 again by substituting the variable measuring the number of outgoing friendship nominations towards Roma classmates with the variables measuring 1.) the proportion of outgoing friendship nominations towards Roma peers, 2.) the proportion of incoming friendship nominations from Roma peers, and 3.) the number of incoming friendship nominations from Roma peers.

Similarly to the number of outgoing nominations, the proportion of outgoing friendship nominations towards Roma friends has a significant positive effect on the change in Roma classification between the two waves. The inclusion of this variable does not alter the direction and statistical significance of the parameter estimates of other variables, it is only the effect of mother's secondary education that becomes non-significant in the new models. However, neither the number nor the proportion of incoming friendship nominations from Roma peers have a significant effect on the change in Roma classification. These results suggest that students' own friendship choices towards

Roma peers influence their perceived ethnicity rather than the number or proportion of Roma classmates who nominate them as friend.

The ‘frm’ R package allows five types of link functions (logit, probit, cauchit, loglog, and complementary loglog) for the fractional regression model. We used the loglog specification in our models. To see how robust the findings are if alternative statistical models are used, however, we repeated the longitudinal analysis with the other four link functions as well.

None of the alternative models provided different directions for the parameter estimates in any of the models. The parameter estimates of some variables, however, are not statistically significant with the alternative model specifications. Using the cauchit specification, the estimate of peer perception of cleverness is not statistically significant in Model 7. In Model 8, the estimate of peer perception of having good grades is not significant using any of the four alternative models. The estimates of mother’s secondary education and helps other in achieving better academic progress are not significant, using the complementary loglog and cauchit specifications. The variable measuring the number of Roma friends does not have a significant effect, using the complementary loglog specification; whereas the estimate of peer perception of cleverness is not significant with the cauchit specification. Parameter estimates and standard errors of the alternative models are presented in Tables 11 and 12 in Section 3.6. Appendix.

To further test the robustness of the longitudinal results, we ran two types of multilevel models. First, we transformed the dependent variable in the following way: we calculated the log of the proportion p divided by $(1 - p)$ to allow for the values to cross the boundaries of 0 and 1. We ran a random-intercept multilevel linear model using this transformed dependent variable. Second, we estimated a multilevel model with the Tobit estimator.

The directions of the parameter estimates are the same in the multilevel models as in the longitudinal fractional regression models. The estimates of the number of Roma friends, peer perception of cleverness, and peer perception of having good grades are not significant at the 0.05 level in the multilevel models (except for peer perception of

cleverness, multilevel linear model, Model 8). Not all dummy variables measuring mother's highest education are significant, only tertiary education. The estimate of hampers others in academic progress, however, is significant in both multilevel models. Parameter estimates and standard errors of the multilevel linear and Tobit models are presented in Tables 11 and 12 in Section 3.6. Appendix.

3.5. DISCUSSION

In this study we examined which factors influence the way students' ethnicity is classified by their classmates. Based on previous research on Roma classification, we expected that students who live under better socio-economic circumstances are less likely to be classified as Roma by their peers than students living under worse socio-economic conditions. We hypothesized that students having more Roma friends in the class are more likely to be classified as Roma than students having fewer Roma friends. We also expected that students who are perceived by peers and teachers as having better academic abilities and achievement are less likely to be classified as Roma by their classmates than students who are perceived as having lower academic abilities and achievement. To test our hypotheses we used cross-sectional and dynamic fractional regression models.

We found both in the cross-sectional and dynamic models that self-declared Roma students are more likely to be classified as Roma by a higher proportion of their peers than self-declared non-Roma students. Consistently with previous studies (Ladányi and Szelényi, 2006; Saperstein and Penner, 2012), however, we found some variation in the Roma classification scores of students. In some cases, moreover, perceptions of students' ethnicity and ethnic self-identification changed between the two waves.

Previous empirical studies mostly treated ethnicity as a fixed characteristic. The findings show that analyses focusing on interethnic relations should distinguish between the effects of ethnic identification and classification, and take into account the fluid nature of both of them. Boda and Néray (2015) provide an example for the inclusion of both ethnic self-identification and peers' classification in the analysis on interethnic relations among Roma and non-Roma students. They found that non-Roma students rejected those classmates whom they perceived as Roma, but this tendency remained

hidden if only self-declared ethnicity of students was included in the analysis. Moreover, they found that Roma students tended to exclude those classmates whom they perceived as Roma, but who, at the same time, identified themselves with the Hungarian group.

In line with our first hypothesis and previous studies (Csepeli and Simon, 2004; Ladányi and Szelényi, 2006), we found that students with poorer socio-economic background are more likely to be classified as Roma by a higher proportion of classmates than students living under better conditions. Furthermore, students having more outgoing friendship nominations towards Roma classmates are more likely to be classified as Roma by a higher proportion of peers than students having fewer Roma friends. These associations were shown both in the cross-sectional and the dynamic models. These findings suggest that characteristics of students' social and economic environment are strongly associated with ethnic classification.

The finding that outgoing friendship nominations are significantly related to being classified as Roma, while incoming nominations are not, seems to contradict the findings reported by Boda (2015). Examining the co-evolution of friendship nominations and ethnic perceptions she found that if student A is seen as popular (getting friendship nominations) among classmates student B perceives as Roma, then it is likely that student B will also perceive student A as Roma. In contrast, student A's friendship nominations towards classmates who are perceived as Roma by student B do not effect student B's perception of student A's ethnicity. Whereas Boda concentrated on interethnic friendship nominations based on ethnic perceptions, in our study, interethnic friendships were operationalized based on self-declared ethnicity of the students. Moreover, while she analysed dyadic nominations, we used aggregated variables in our analysis. The contradictions between the findings suggest, however, that further analysis is needed to better understand the relationship between ethnic self-identification, ethnic classification, and interethnic relations of students.

In the cross-sectional models based on the first-wave data, we did not find any statistically significant effects of the variables measuring students' and teachers' perceptions of academic abilities and achievement. The reason for this might be that first-wave data capture ethnic classification based on students' first impressions of their

classmates. A few weeks after getting to know each other students might be more likely to classify others based on social status and social relations, because academic abilities and achievement might have not yet been revealed. In the second wave, students perceived by peers and teachers as clever and smart were classified as Roma by a lower proportion of peers.

In the dynamic models we also found that students perceived by classmates and teachers as clever and smart were less likely to be classified as Roma over time, than students being not perceived as clever and smart. Having been honoured, moreover, had a negative effect on the change in Roma classification. The effect of having good grades, however, pointed in the opposite direction we expected, although the coefficient was significant only in Model 8, and not robust, using other statistical models. Moreover, the cross-sectional bivariate relationship between being perceived as having good grades and being perceived as Roma in T1 is negative. It is possible, that students' initial perceptions about their Roma classmates' grades represented by the negative bivariate relationship between these variables measured in T1 changed into the positive direction over time, and the negative correlation coefficient in T2 became smaller or even disappeared. But we cannot examine this assumption because data on the variable measuring peer perception of having good grades are not available in the second wave. It is also possible that there is a negative bivariate relationship between the score on peer perception of having good grades and the change in the Roma classification score, but controlling for other variables in the regression models, the associations are positive.

This finding is particularly interesting because having good grades might better represent academic achievement and aspirations than being clever and smart. Cleverness might manifest itself in other areas of life as well, whereas having good grades is more closely related to proper adaptation to schools' requirements. We calculated the correlation between the scores on being perceived as having good grades and being perceived as clever and smart, on the one hand, and the mean grade students received at the end of their first school-year (two month after the second wave), on the other hand, for a subsample of 252 students (for those with data on grades). Being perceived as having good grades is indeed slightly more strongly associated with better grades ($r=0.510$, $p<0.01$ in T1) than being perceived as smart ($r=0.472$ and 0.478 in T1

and T2, respectively, $p < 0.01$). Thus, perceptions of having good grades are slightly more strongly related to later academic achievement measured by grades than perceptions of being smart. The literature on oppositional culture and the acting white phenomenon suggests that perceptions of having good grades, as a better proxy for academic achievement, should have larger effect on Roma classification than being perceived as clever and smart after controlling for both variables. Our results, however, show the opposite tendency.

Furthermore, students who were reported to help others in achieving better academic progress according to teacher reports had higher scores on Roma classification over time than students not being reported, although cross-sectional bivariate analyses between these variables showed significant negative associations, and the comparison of the bivariate correlations in T1 and T2 suggests the opposite tendency. These results suggest that the positive relationship found in Model 8 between being perceived by teacher as helping others and being perceived by classmates as Roma is only present when we control for other factors in the regression model that are probably associated with both variables. In sum, our results are only partially consistent with the third hypothesis; the cross-sectional and longitudinal analyses suggest that the effects of peers' and teachers' perceptions of academic abilities and achievement on Roma classification are not unambiguously negative.

The major limitation of our study is that we did not have data on every students' academic achievement in the subsample. The acting white literature suggests that there are ethnic differences in the relationships between students' status and academic achievement (Fryer Jr. and Torelli, 2010). Following this line, we expected that academic achievement would influence the way students' ethnicity is classified by their peers. To test this hypothesis we would need data on students' grades. However, we only have variables which can be used as proxies for academic achievement of students: peers' perceptions of being clever and having good grades, teachers' evaluations whether the students are clever, hardworking, help others in achieving better academic progress, or hamper others in academic progress, and whether students were honoured in school.

Another limitation is that we analysed aggregated measures of classmates' perceptions instead of focusing on dyadic nominations separately. Therefore, we have not taken into account the dependencies among nominations of classmates. Perceptions of someone else's ethnicity or academic abilities, however, might be influenced by others' perceptions. Moreover, ethnic classification made by Roma and non-Roma classmates might show different patterns. Future studies should also analyse the interdependencies among students' perceptions and the differences in classification made by Roma and non-Roma students.

A third limitation is that we have not examined the reversed causal link between the variables. Although the longitudinal analysis suggests that social status, social ties, and perceptions of academic abilities and achievement have an effect on ethnic classification, being classified as Roma probably also influences students' social networks and academic achievement, and others' perceptions about achievement.

Other factors may also exert an influence on peer classification. Living in a Roma neighbourhood, for instance, may increase the possibility of being identified as Roma by the classmates (Csepeli and Simon, 2004; Ladányi and Szelényi, 2006). However, we do not have data on students' exact place of residence. Although we asked students whether they live in a neighbourhood with mostly other Roma families, additional analysis has not shown any significant effect of this subjective residential segregation measure on ethnic classification score. Future studies may take into account the effect of living in a segregated Roma neighbourhood on being classified as Roma.

Future research should also focus on other age and ethnic groups. In this study, we analysed a subsample of Roma and non-Roma first-year secondary school students in Hungary. The mechanisms of ethnic classification, however, might be different in various age groups such as among children, pre-adolescents, adolescents, and adults. It is also to be studied how classification systems work in other countries, and in the case of other ethnic groups. Previous studies (Csepeli and Simon, 2004; Ladányi and Szelényi, 2006) suggest that ethnic perceptions might differ in different countries based on the patterns of segregation and exclusion.

The major strength of this study is that we had the possibility to analyse a unique database containing information on ethnic perceptions of students. Ethnic perceptions were measured at different points in time: some weeks after students got to know each other as well as half a year later. As a result, we have showed that ethnic classification varies depending on who does the classification and may change over time. We also showed that ethnic classification is not only associated with self-declared ethnicity but with other factors such as socio-economic status, the ethnicity of friends, or academic abilities and achievement as well. These findings are important because being classified as Roma might have far-reaching consequences on students' school performance and later life. It is therefore essential to understand the underlying mechanisms behind ethnic classification processes.

3.6. APPENDIX TO CHAPTER 3

Table 9. Average partial effects in the cross-sectional fractional regression models in T1 and T2

Dependent variable Roma cassification	Model 1 (T1)			Model 2 (T1)			Model 3 (T1)			Model 4 (T1)			Model 5 (T2)			Model 6 (T2)		
	Est.	SE		Est.	SE		Est.	SE		Est.	SE		Est.	SE		Est.	SE	
number of Roma friends	0.007	0.002	***	0.007	0.002	***	0.007	0.002	***	0.007	0.002	***	0.007	0.003	*	0.005	0.005	
peer perception of cleverness	-0.107	0.085		-0.104	0.093		-0.097	0.053		-0.112	0.077		-0.197	0.092	*	-0.267	0.144	
peer perception of having good grades	0.013	0.068		-0.011	0.072													
mother's education																		
vocational school	-0.026	0.007	***	-0.025	0.007	***	-0.026	0.007	***	-0.025	0.007	***	-0.043	0.010	***	-0.061	0.015	***
secondary education	-0.033	0.015	*	-0.033	0.014	*	-0.032	0.015	*	-0.033	0.014	*	-0.050	0.011	***	-0.068	0.018	***
tertiary education	-0.055	0.018	**	-0.053	0.018	**	-0.055	0.018	**	-0.053	0.018	**	-0.082	0.019	***	-0.117	0.030	***
socially disadvantaged	0.043	0.013	***	0.042	0.013	***	0.043	0.013	***	0.042	0.013	***	0.060	0.013	***	0.091	0.020	***
self-declared ethnicity																		
Roma	0.176	0.017	***	0.178	0.017	***	0.176	0.017	***	0.178	0.017	***	0.246	0.015	***	0.259	0.020	***
Roma and Hungarian	0.139	0.013	***	0.141	0.013	***	0.139	0.013	***	0.141	0.013	***	0.193	0.014	***	0.182	0.016	***
boy	0.000	0.015		0.000	0.015		0.000	0.015		0.000	0.015		-0.020	0.013		-0.018	0.012	
teacher's perception																		
clever, smart				0.007	0.013					0.007	0.013					-0.040	0.016	**
hardworking				0.016	0.013					0.016	0.012					-0.026	0.018	
helps others				-0.031	0.020					-0.031	0.020					0.062	0.032	
hampers others				-0.008	0.014					-0.008	0.014					-0.001	0.019	
was honoured				-0.000	0.016					0.000	0.016					-0.010	0.026	
N	629			629			629			629			629			308		

*p<0.05, **p<0.01, ***p<0.001

Table 10. Average partial effects in the dynamic fractional regression models

Dependent variable: Roma cassification (T2)	Model 3			Model 4		
	Estimate	SE		Estimate	SE	
Roma classification (T1)	0.546	0.043	***	0.550	0.040	***
number of Roma friends	0.004	0.001	**	0.004	0.001	**
peer perception of cleverness	-0.203	0.068	**	-0.189	0.059	***
peer perception of having good grades	0.056	0.039		0.080	0.040	*
mother's education						
vocational school	-0.014	0.008		-0.012	0.007	
secondary education	-0.021	0.010	*	-0.018	0.009	
tertiary education	-0.031	0.012	*	-0.034	0.013	**
socially disadvantaged	0.032	0.011	**	0.032	0.010	**
self-declared ethnicity						
Roma	0.079	0.015	***	0.076	0.014	***
Roma and Hungarian	0.087	0.008	***	0.084	0.008	***
boy	-0.014	0.011		-0.016	0.010	
teacher's perception						
clever, smart				-0.037	0.010	***
hardworking				0.014	0.009	
helps others in achiving better academic progress				0.031	0.011	**
hampers others in academic progress				0.024	0.015	
was honoured				-0.029	0.009	**
N	629			629		

*p<0.05, **p<0.01, ***p<0.001

Table 11. Results of different longitudinal models for Model 3 (fractional regression models with loglog, logit, probit, cloglog, cauchit specification, multilevel Tobit, and multilevel linear models)

[illegible]

Table 12. Results of different longitudinal models for Model 4 (fractional regression models with loglog, logit, probit, cloglog, cauchit specification, multilevel Tobit, and multilevel linear models)

	fr loglog		fr logit		fr probit		fr cloglog		fr cauchit		multilevel Tobit		multilevel linear	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Intercept	-1.210	0.105	-3.053	0.292	-1.735	0.143	-2.996	0.257	-5.810	1.243	-0.010	0.020	-3.620	0.139
Roma classification (T1)	3.093	0.303	5.079	0.468	2.990	0.268	3.554	0.355	4.402	0.533	0.960	0.042	6.156	0.314
number of Roma friends	0.020	0.007	0.031	0.014	0.019	0.008	0.021	0.012	0.022	0.011	0.003	0.002	0.025	0.015
peer perception of cleverness	-1.065	0.309	-2.594	0.779	-1.401	0.385	-2.005	0.622	-1.497	1.078	-0.173	0.094	-1.225	0.615
peer perception of having good grades	0.450	0.220	0.950	0.721	0.532	0.319	0.619	0.648	0.514	1.196	0.043	0.087	0.290	0.570
mother's education														
vocational school	-0.069	0.040	-0.124	0.092	-0.073	0.048	-0.071	0.076	-0.086	0.100	-0.012	0.013	-0.053	0.089
secondary education	-0.098	0.050	-0.288	0.135	-0.143	0.067	-0.236	0.123	-0.277	0.184	-0.017	0.016	-0.071	0.108
tertiary education	-0.188	0.074	-0.598	0.187	-0.288	0.093	-0.529	0.176	-0.570	0.268	-0.055	0.023	-0.325	0.144
socially disadvantaged	0.180	0.058	0.397	0.163	0.223	0.084	0.339	0.137	0.413	0.189	0.039	0.012	0.251	0.088
self-declared ethnicity														
Roma	0.430	0.077	1.054	0.172	0.557	0.085	1.118	0.184	4.020	1.176	0.133	0.017	1.113	0.132
Roma and Hungarian	0.474	0.046	1.232	0.126	0.650	0.057	1.261	0.145	4.173	1.136	0.152	0.015	1.326	0.113
boy	-0.091	0.057	-0.154	0.134	-0.094	0.073	-0.109	0.114	-0.149	0.129	-0.034	0.012	-0.182	0.078
teacher's perception														
clever, smart	-0.210	0.057	-0.506	0.148	-0.272	0.078	-0.437	0.154	-0.582	0.143	-0.057	0.015	-0.306	0.100
hardworking	0.076	0.050	0.216	0.128	0.114	0.065	0.198	0.105	0.230	0.156	0.026	0.015	0.181	0.102
helps others	0.174	0.061	0.349	0.171	0.197	0.084	0.257	0.151	0.339	0.190	0.051	0.018	0.330	0.118
hampers others in academic progress	0.132	0.086	0.239	0.196	0.139	0.105	0.156	0.151	0.179	0.191	0.035	0.017	0.256	0.119
was honoured	-0.165	0.051	-0.319	0.138	-0.179	0.069	-0.248	0.097	-0.379	0.131	-0.040	0.015	-0.209	0.094
N	629		629		629		629		629		629		629	

4. THE QUALITY OF INTER- AND INTRA-ETHNIC FRIENDSHIPS¹⁴

4.1. INTRODUCTION

Intra-ethnic friendships among students were found to be more common than interethnic ones in most previous studies (Baerveldt et al., 2004; Hallinan and Williams, 1989; Kao and Joyner, 2004; Moody, 2001; Mouw and Entwisle, 2006; Quillian and Campbell, 2003; Rodkin et al., 2007; Smith et al., 2014). The quality of interethnic friendships, however, has hitherto received less attention. Positive interethnic relations may not only be less common than intra-ethnic ones, but they might also be less likely to be characterized by intimacy. Studies examining the quality of cross-ethnic ties indeed found that interethnic friendships were reported to be less close and intimate than intra-ethnic ones (Aboud et al., 2003; Kao and Joyner, 2004; Schneider et al., 2007). Moreover, cross-ethnic friendships were less stable than same-ethnic ones (Aboud et al., 2003; Boda, 2015; Rude and Herda, 2010; Schneider et al., 2007).

Previous studies on interethnic relations usually treated race and ethnicity as fixed characteristics of students, measured by racial or ethnic self-identification (Hallinan and Williams, 1989; Kao and Joyner, 2004; Moody, 2001; Mouw and Entwisle, 2006; Quillian and Campbell, 2003; Rude and Herda, 2010; Verkuyten and Thijs, 2002), or the country of birth of the parents (Baerveldt et al., 2004; Tolsma et al., 2013; Vervoort et al., 2010). Ethnic identification, the way individuals identify themselves ethnically, however, may be different from ethnic classification, the way others categorize them as members of ethnic groups (Boda and Néray, 2015; Saperstein and Penner, 2012; Simonovits and Kézdi, 2014). Moreover, both ethnic identification and classification might be fluid and can change over contexts and time (Csizmadia et al., 2012; Eschbach and Gómez, 1998; Ladányi and Szelényi, 2006; Saperstein and Penner, 2012; Vignoles et al., 2011). Analyses of interethnic relations, therefore, should distinguish between the

¹⁴ This chapter is a revised version of a paper submitted to *Corvinus Journal of Sociology and Social Policy*.

effects of ethnic identification and classification, and take into account the fluid nature of both of them (Saperstein, 2006).

Boda and Néray (2015) analysed the positive (friendship) and negative (disliking) relations between Roma and non-Roma students in the same dataset that is used in this chapter. They found that friendship nominations between self-declared Roma students were more likely than interethnic nominations. Friendship nominations between self-declared non-Roma students, however, were not significantly more likely than cross-ethnic nominations. Roma students, moreover, preferred only those Roma peers whom they perceived as Roma and who themselves declared being Roma as well. Non-Roma students tended to dislike those classmates whom they perceived as Roma. Some of these tendencies would have remained hidden if the authors had not differentiated between ethnic self-identification and classification by peers in the analysis.

The aim of this chapter is to further extend our current knowledge of friendship relations between Roma and non-Roma students. Therefore, we compare the quality of inter- and intra-ethnic friendships and examine whether we find different results including self-declared ethnic identification of students on the one hand, and peer perceptions of classmates' ethnicity on the other hand, in the analysis. To answer our research question we do a descriptive analysis of data from 13 classes of a Hungarian panel study conducted among Roma and non-Roma secondary school students. We investigate whether there is ethnic segregation in friendship nominations, shared activities, trust relations, and perceived helpfulness nominations analysing network matrices of school classes. We also examine whether outgoing inter- and intra-ethnic friendship nominations differ from each other with regard to the proportion of reciprocated ties, and co-occurring trust, perceived helpfulness, and jointly spent spare time nominations.

4.2. THEORETICAL BACKGROUND

4.2.1. Opportunities for Friendship

Two major factors play a role in friendship formation: the *opportunities* of people to get to know each other and the *preferences* they have when they choose their friends (Baerveldt et al., 2004; Flache and Stark, 2009; Hallinan and Williams, 1989; Moody, 2001; Mouw and Entwisle, 2006; Wimmer and Lewis, 2010; Zeng and Xie, 2008). In this section, we first introduce the relevant theoretical literature regarding students' opportunity to befriend each other. Then we continue with theories focusing on individual preferences.

Opportunities for contact are necessary to form friendships. People with similar status are more likely to meet each other and form acquaintanceships. Mating, the process of friendship formation among acquaintances, however, is influenced by both opportunities of contact and attraction between people (Verbrugge, 1977).

In the socio-psychological tradition *propinquity effect* describes the phenomena that interpersonal attraction is greater towards others with whom people encounter more often (Festinger et al., 1950; Newcomb, 1961; Segal, 1974). If people often meet others who are different from them, the frequency of heterogeneous relations increase (Blau and Schwartz, 1984). Blau (1977a) theorized that the likelihood that people form intergroup relations can be derived from structural conditions without taking into account any socio-psychological assumptions. For instance, the size of the ingroup influences the probability of intergroup relations, increasing heterogeneity promotes intergroup relations, or intersecting social parameters increases the likelihood of intergroup associations, while strongly correlated parameters impede them.

Blau's theory is based on the assumption that the formation of social relations depends on opportunities for social contact. *Contact theory* formulated by Allport (1954), however, suggests that opportunity for interpersonal contact is a necessary but not sufficient condition for positive intergroup relations. In order to diminish intergroup conflict and individuals' prejudice towards members of the outgroup, status equality,

common goals, intergroup cooperation, and institutional support of the contact are also needed.

Pettigrew and Tropp (2006) found in a large-scale meta-analytic study that intergroup contact can indeed reduce intergroup prejudice, even without the optimal conditions defined by Allport (1954). If the contact situation meets Allport's conditions, the positive effect of contact on prejudice is even greater. Pettigrew (2008) argues, however, that intergroup contact can lead to negative experiences with members of the outgroup, which may negatively affect intergroup attitudes. Stark and co-authors (2013) indeed found that disliking relations of students had about equally strong influence on outgroup attitudes than liking relations did.

Moody (2001) pointed out that schools provide an important mixing opportunity for students of different ethnic background. Organizational features of schools influence both the opportunities for ethnic groups to contact each other (Blau, 1977b; Coleman, 1961; Feld, 1981; Feld and Carter, 1998; Hallinan and Williams, 1989; Newcomb, 1961), and the social significance of interaction among them (Allport, 1954; Schofield, 1991, 1979). Schools can thus impede or foster the formation of interethnic friendship relations. Academic tracking, for instance, not only separates students but also creates status differentials among them, if selection into tracks is based on school performance, which often correlates with students' social status and ethnicity (Epstein, 1985; Hallinan and Williams, 1987; Longshore and Prager, 1985; Schofield, 1991). Extracurricular activities, however, provide opportunity for cooperative interaction between students of different ethnic background, and can promote the formation of interethnic friendships (Crain, 1981; Holland and Andre, 1987; Slavin and Madden, 1979).

The number and proportion of minority students in a school also influence the opportunity for intergroup contact. Feld and Carter (1998) argue that cross-ethnic ties are usually weak ones (Granovetter, 1983, 1973). One's capacity to create weak ties is not limited unlike forming and maintaining close friendships. The number of potential weak ties, therefore, depends only on contact opportunities. Paradoxically, the number of potential interethnic ties is the greatest if minority students are concentrated in one large school (Feld and Carter, 1998).

In contrast, people have limited capacity to form and maintain close relations (Van der Poel, 1993; Zeggelink, 1993). If minority students are concentrated in one large school instead of being equally distributed among more schools, they can achieve their desired number of friends from their own ethnic group, and may be less willing to befriend students of other ethnic groups. In line with the assumptions of Allport's contact theory, research results indicate that intimate, strong ties are important types of interethnic relations. It seems that the quality not the quantity of relations contributes to the reduction of negative outgroup attitudes (Vervoort et al., 2011). Strong, affective relations are more likely to have lasting effects on attitudes and behaviour than weak ones (Feddes et al., 2009; Munniksma et al., 2013; Pettigrew, 1998; Powers and Ellison, 1995).

4.2.2. Preferences for Friendship

Besides opportunity, preferences of individuals also exert an influence on friendship choices. Theories explaining people's preferences are rooted in two major disciplines: exchange theory is formulated based on the main assumptions of economics, while theories explaining cognitive and affective aspects of relations belong to the psychological and social-psychological tradition (Lőrincz, 2006).

Exchange theory (Homans, 1961; Thibaut and Kelley, 1959) argues that friendship choices can be explained by the goal of maximizing utility. Formation and maintenance of relations are costly but also provide benefits for individuals. People's aim is to minimize the costs and maximize the benefits they gain when they make decisions about their relations. The *investment model* of commitment processes adds the assumption that satisfaction and commitment in close relationships also depend on the former investments of the partners (Rusbult, 1983, 1980).

Among psychological theories there are several approaches that attempt to explain why people prefer to befriend similar others, which is known as the *homophily* principle in psychology, sociology, and network studies (Blau, 1977b; Coleman, 1961; Kandel, 1978; Lazarsfeld and Merton, 1954; McPherson et al., 2001; Tuma and Hallinan, 1979; Verbrugge, 1977). Socio-psychological explanations of the tendency of homophily suggest that similarities validate one's social identity (Festinger et al., 1950; Schachter,

1959), reduce potential conflicts (Sherif et al., 1961), and contribute to the development of balanced social situations (Newcomb, 1961, 1956). Homophily has been identified on multiple social dimensions, it can therefore increase ethnic segregation in different ways: directly through students' preference for same-ethnic friends and indirectly by homophily on other attributes correlating with ethnicity (Moody, 2001; Wimmer and Lewis, 2010).

Social identity theory (Tajfel and Turner, 1979) also describes a possible explaining mechanism of the prevalence of same-ethnic relations. Social identity theory states that individuals need to belong to a group with a positive identity. For many people, ethnicity is considered to be a salient social dimension that can lead to the accentuation of differences among ethnic groups. It might increase prejudice and impede the possibility of the formation of positive interethnic relations (Baerveldt et al., 2004).

Balance theory (Heider, 1946) provides another model for friendship formation. Balance theory expands the explanation of friendship development to multiple actors and assumes that people strive to have balanced social relations and would like to avoid cognitive inconsistencies. Balanced relations occur when 'the friend of my friend is my friend' (also known as transitivity in social network analysis) and 'the enemy of my enemy is my friend', but antipathy between one's friends leads to psychological tension (Davis, 1963; Davis and Leinhardt, 1967; Heider, 1946; Holland and Leinhardt, 1971; Johnsen, 1985). Transitivity can also reinforce ethnic homophily in social networks. If one's friends prefer to befriend co-ethnic peers, it is also more likely that one will form a new friendship tie with a co-ethnic peer, because friends of friends become more likely one's friends than unknown people.

Friendships provide the feeling of belongingness and being accepted by others, and help to cope with stress, which functions are particularly important during adolescence, when friends play a crucial role in the development of one's self-concept (Quillian and Campbell, 2003). Tatum (Tatum, 1999, 1987) argues that intra-ethnic friendships may be especially important for minority children because same-ethnic friends can provide *social support* for peers and help to cope with experiences of ethnic prejudice and discrimination.

4.2.3. The Focus of the Present Study

Windzio and Bicer (2013) suggest from a rational choice perspective, that ethnic segregation might be more pronounced in closer and more intimate relations than in friendship nominations. In contrast to friendship nominations in classrooms, they argue, spending spare time together or visiting each other at home require more time and effort and are therefore more costly. Moreover, ethnic boundaries might be particularly important when parental acceptance is also needed to establish a tie. In line with their expectations they found that ethnic segregation was more pronounced in closer ties compared to friendship nominations among fourth-grade students, especially when parental approval was needed (such as visiting each other at home).

Though numerous studies have examined the prevalence and explanatory factors of interethnic friendships (Baerveldt et al., 2004; Boda and Néray, 2015; Hallinan and Williams, 1989; Moody, 2001; Mouw and Entwisle, 2006; Quillian and Campbell, 2003; Rambaran et al., 2015; Vervoort et al., 2011), less investigation has been devoted to the question how the quality of inter- and intra-ethnic relations differ in terms of shared activities, trust, or intimacy. Kao and Joyner's study (2004) belongs to the few exceptions. They found that interethnic friendships are less likely to occur among best-friend nominations than among higher-order (i. e. second, third, etc.) nominations, and interethnic friends usually share fewer activities than intra-ethnic friends. The authors argue that shared activities provide a valid indicator of the intimacy of friendships, and even those youths who tend to befriend pupils from ethnic outgroups form more intimate friendships with same-ethnic peers. Aboud and colleagues (2003) examining relations among primary school students also found that with regard to intimacy, mutual cross-race friendships were rated lower than same-race ones. Loyalty and emotional security, however, characterized both same- and cross-race friendships.

Our research question focuses on how existing intra- and interethnic positive relations differ from each other regarding intimacy and closeness measured by mutuality, shared activities, helpfulness, and trust. More specifically, we examine the differences between cross- and same-ethnic friendship nominations with regard to reciprocity, and co-occurring jointly spent spare time, trust, and perceived helpfulness nominations. Based on the frequently observed homophily principle (Blau, 1977b; Coleman, 1961; Kandel,

1978; Lazarsfeld and Merton, 1954; McPherson et al., 2001; Tuma and Hallinan, 1979; Verbrugge, 1977) and previous findings (Aboud et al., 2003; Kao and Joyner, 2004; Schneider et al., 2007; Windzio and Bicer, 2013), we expect that even if students nominate friends from other ethnic groups, intimate friendships will be more often formed with same-ethnic peers. Therefore, we formulate the following hypotheses:

Hypothesis 1: Interethnic friendship nominations are less often reciprocated than intra-ethnic ones.

Hypothesis 2: Interethnic friendship nominations are less frequently characterized by a co-occurring trust nomination than intra-ethnic ones.

Hypothesis 3: Nominated interethnic friends are less often perceived helpful than intra-ethnic ones.

Hypothesis 4: Interethnic friendship nominations are less frequently characterized by a co-occurring jointly spent spare time nomination than intra-ethnic ones.

Roma people experience higher level of discrimination and prejudice than any other ethnic groups in Hungary. The situation is not different in the case of students; in surveys conducted in primary and secondary schools, roughly every second pupil expressed that they would be bothered if a Roma student sat next to them in the classroom (Csákó, 2011; Ligeti, 2006). In another study, however, Roma students tended to accept non-Roma students and to have more positive attitudes toward their non-Roma peers than vice versa (Kézdi and Surányi, 2008). In the analysis we thus differentiate between interethnic ties from Roma towards non-Roma and from non-Roma towards Roma students. Similarly, we analyse intra-ethnic nominations between Roma and intra-ethnic nominations between non-Roma students separately.

4.3. DATA AND METHOD

4.3.1. Participants

We analysed a subsample of the first (T1) and second (T2) waves of the RECENS dataset described in Chapter 2. In the third and fourth waves, the number of Roma students dropped dramatically; therefore, we restricted the investigation to the first two waves of the research. We selected classrooms where, in both waves, the response rate reached 80% and which classrooms were attended by at least 10% of Roma students. Thus, our subsample comprised 13 classrooms with a mean class size of 32 (SD=3.65) and 33 students (SD=4.32) in wave 1 and 2, respectively. Three classes provided vocational education, which do not provide the possibility to enter tertiary education in Hungary. Ten classes were technical school classes. The subsample contains only one secondary grammar school class. In the first wave, 168 boys (40.2%) and 250 girls (59.8%), in the second wave, 171 boys (40.1%) and 255 girls (59.9%) attended these classes. In the two waves, 32.3% and 33.8% of the students reported being either Roma or both Roma and Hungarian.

4.3.2. Measures

Friendship nominations. Students were asked to evaluate their relationships to all other classmates. Positive and negative relations were measured on a scale ranging from -2 to 2, where -2 represented '*I hate him/her*', -1 indicated '*I do not like him/her*', 0 referred to '*He/she is neutral to me*', 1 indicated '*I like him/her*' and 2 represented '*He/she is my friend*'. 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*.

Trust. Students were asked to nominate all of their classmates whom they could trust ('*If I had a secret, I would tell it him/her*'). For each class, a trust matrix has been created, where a directed tie is present if there is a nomination from individual *i* to *j*.

Table 13 Descriptive statistics of the subsample of Chapter 4

Class ID	School type	Type of settlement	N (T1)	N (T2)	Number of students declared to be Roma only (T1)	Number of students declared to be Roma only (T2)	Number of students declared to be both Roma and Hungarian (T1)	Number of students declared to be both Roma and Hungarian (T2)	Number of Roma* (T1)	Number of Roma* (T2)	Number of girls (T1)	Number of girls (T2)
2100	Technical	Large town	27	27	6	8	9	6	15	14	23	24
2200	Technical	Large town	31	28	12	10	3	3	15	13	22	21
2400	Technical	Large town	29	32	5	5	1	5	6	10	18	20
2800	Vocational	Large town	32	34	11	10	8	11	19	21	21	22
3300	Technical	Middle-sized town 1	37	38	2	6	6	5	8	11	2	2
3400	Grammar	Middle-sized town 1	36	37	0	0	4	4	4	4	14	14
4400	Technical	Middle-sized town 2	38	38	2	2	5	7	7	9	30	30
5200	Vocational	Middle-sized town 2	26	25	9	9	4	3	13	12	0	0
5400	Technical	Middle-sized town 2	35	38	3	4	6	5	9	9	18	18
5600	Vocational	Middle-sized town 2	31	31	10	13	10	8	20	21	31	31
7100	Technical	Capital	32	32	3	4	4	4	7	8	24	24
7300	Technical	Capital	31	32	5	3	2	3	7	6	20	21
7400	Technical	Capital	33	34	2	3	3	3	5	6	27	28
Total			418	426	70	77	65	67	135	144	250	255

* Number of Roma students was calculated summing the number of self-reported ‘both Roma and Hungarian’, and ‘Roma’ students.

Perceived helpfulness. Students were asked to nominate all of their classmates on whom they could count if they needed help (‘*If I needed help, I could count on him/her*’). For each class, a perceived helpfulness matrix has been created, where a directed tie is present if there is a nomination from individual i to j .

Shared activities. Students were asked to nominate their classmates with whom they do the following activities together: 1. ‘*We usually go home together*’; 2. ‘*We have private classes or do sports together*’; 3. ‘*We spend our spare time together*’; 4. ‘*We study together*’; 5. ‘*I usually sit next to him/her*’. For each class, matrices have been created, where a directed tie is present if there is a nomination from individual i to j in the given network.

Ethnicity. In the present study we distinguish between self-declared ethnicity and perceived ethnicity, measured by the ethnic classification made by the students’ classmates. Self-declared ethnicity was measured by asking students to classify themselves as ‘*Hungarian*’, ‘*Roma*’, ‘*both Hungarian and Roma*’, or members of ‘*another ethnicity*’. We recoded students belonging to the ‘*Hungarian*’ or ‘*other ethnicity*’ as non-Roma (T1: $N=283$ and T2: $N=282$), and students belonging to the ‘*Roma*’ or ‘*both Roma and Hungarian*’ category as Roma (T1: $N=135$ and T2: $N=144$). Missing data on students’ ethnicity were imputed using data from the other waves¹⁵.

To measure peer perceptions of ethnicity, students were provided a list of all classmates and were asked to nominate whom they considered Roma. Thus, we have a Roma perception network where, for each dyadic relation, 1 indicates that the respondent i classified the given classmate j as Roma, and 0 indicates that the respondent did not consider the receiver Roma.

¹⁵ Although some changes in self-reports of ethnic identification occurred between the different waves (with regard to the changes between the Roma and non-Roma categories: 3.2%, 2.3%, and 0.7% between the consecutive waves, respectively), ethnic self-identification reported in other waves is statistically still the best predictor of ethnic identification of students.

4.3.3. Analytical Strategy

For both waves, we calculated descriptive statistics for all the above-mentioned networks. Nominations, however, were very sparse in the trust and perceived helpfulness networks in the first wave. Therefore, we decided to further analyse only matrices from the second wave. Similarly, most networks of shared activities had very low densities in both waves, but densities in the second wave were a bit higher than densities in the first wave. Moreover, some of these relations do not exclusively depend on students' decisions. Being deskmates, for instance, may depend on teachers' instructions. Going home together may be influenced by living in the same village. Therefore, we decided to further analyse the second wave network of the jointly spent spare time nominations.

We summed the number of all types of interethnic (from Roma towards non-Roma; from non-Roma towards Roma) and intra-ethnic (from Roma towards Roma; from non-Roma towards non-Roma) directed friendship nominations separately for all classes first. Then, in each class and each group, we calculated the proportion of reciprocated friendship nominations. We also calculated the number of cases when the friendship nomination co-occurred with 1.) an outgoing trust, 2.) an outgoing perceived helpfulness, and 3.) an outgoing jointly spent spare time nomination, respectively, and calculated the proportions of these ties among the friendship nominations separately in the classrooms. At the end, we calculated the same indicators for the whole subsample as well, and tested the hypotheses, using chi-squared test. We took into account receivers' ethnic self-identification first, then, we repeated the same analysis using peer perceptions of receivers' ethnicity.

4.4. RESULTS

4.4.1. Descriptive Analysis

We calculated the average density, the average reciprocity, and the average in- and outdegree over all classrooms for all networks. We also calculated the average density of nominations from Roma towards Roma, from Roma towards non-Roma, from non-Roma towards Roma, and from non-Roma towards non-Roma students based on the

ethnic self-identification of senders and receivers. The results are presented in Tables 14 and 15.

In most networks, the density increased from the first wave to the second. In the case of trust networks, for example, the average density of the 13 classes increased from 3.27% to 5.79%. In the case of perceived helpfulness, the networks became even denser; in the second wave, 8.52% of all possible nominations were actually present on average in the classes. The explanation for the change might be that in the time of the first wave of data collection, classes were relatively new and students did not know well each other. Until the second wave, they had enough time to get to know their classmates better and form intimate relations with them. The average reciprocity also increased between the two waves in most networks, showing that not only more relations were formed between the two waves, but ties became reciprocated more frequently.

The low densities and average degrees of the networks of shared activities (going home together, having private classes or do sports together, spending spare time together, studying together) show that students only mention a few classmates with whom they do the above-mentioned activities. On average, students mention one classmate with whom they spend their spare time or go home together. Studying, having private classes or doing sport together with a classmate happens even more rarely.

In all studied networks, intra-ethnic nominations are more common than interethnic ones. Examining intra-ethnic (Roma–Roma and non-Roma–non-Roma) and interethnic (Roma–non-Roma and non-Roma–Roma) matrices we find large differences in the average densities of the networks. In the case of second-wave friendship nominations, for instance, more than 20% of all possible Roma–Roma and non-Roma–non-Roma ties, whereas less than 6% of all possible Roma–non-Roma and non-Roma–Roma ties are actually present in the classes on average. This association can be found in the case of every other network items as well.

Table 14. Descriptive statistics of the friendship, trust, perceived helpfulness, and being deskmates networks in T1 and T2

	Friendship T1	Friendship T2	Trust T1	Trust T2	Perceived helpfulness T1	Perceived helpfulness T2	Deskmate T1	Deskmate T2
Total number of nominations	2352	1791	436	672	394	1018	1471	1706
Average density over all classrooms (SD)	17.80% (2.80%)	15.65% (3.05%)	3.27% (1.42%)	5.79% (2.88%)	2.87% (1.80%)	8.52% (3.51%)	11.60% (3.51%)	15.15% (3.96%)
Average reciprocity over all classrooms (SD)	32.34% (6.48%)	33.20% (10.22%)	6.46% (6.66%)	22.96% (11.37%)	1.90% (2.56%)	20.24% (10.63%)	30.01% (6.06%)	36.41% (9.86%)
Average in-/outdegree	5.60	4.56	1.04	1.71	0.94	2.59	3.51	4.34
Average density of non-Roma → non-Roma nominations (SD)	21.72% (6.54%)	18.63% (5.23%)	4.29% (2.17%)	7.52% (3.95%)	2.75% (2.36%)	10.16% (5.18%)	14.77% (5.84%)	20.06% (7.58%)
Average density of non-Roma → Roma nominations (SD)	5.34% (2.85%)	6.04% (6.74%)	1.37% (1.25%)	1.49% (1.37%)	2.12% (1.83%)	2.42% (1.85%)	3.73% (1.44%)	6.37% (5.15%)
Average density of Roma → non-Roma nominations (SD)	5.65% (2.24%)	5.85% (4.33%)	0.66% (0.74%)	1.48% (1.37%)	0.72% (0.71%)	2.91% (2.34%)	3.80% (2.76%)	4.79% (3.58%)
Average density of Roma → Roma nominations (SD)	25.53% (13.87%)	21.70% (5.72%)	5.35% (4.58%)	10.28% (6.09%)	2.48% (2.59%)	13.60% (8.19%)	21.57% (16.15%)	19.28% (7.56%)

Note: average densities of inter- and intra-ethnic nominations are calculated based on self-declared ethnic identification of students

Table 15. Descriptive statistics of the going home together, having private classes/doing sport together, spending spare time together, and studying together networks in T1 and T2

	Going home together T1	Going home together T2	Private classes/sport together T1	Private classes/sport together T2	Spending spare time together T1	Spending spare time together T2	Studying together T1	Studying together T2
Total number of nominations	562	509	306	282	450	444	99	126
Average density over all classrooms (SD)	4.14% (1.90%)	4.35% (1.51%)	2.25% (2.67%)	2.07% (2.86%)	3.37% (1.37%)	3.73% (1.75%)	0.74% (0.55%)	1.07% (0.62%)
Average reciprocity over all classrooms (SD)	32.87% (9.02%)	32.67% (12.33%)	6.44% (7.49%)	29.02% (35.11%)	20.04% (7.25%)	28.52% (14.26%)	17.77% (18.19%)	15.28% (17.50%)
Average in-/outdegree	1.34	1.30	0.73	0.72	1.07	1.13	0.24	0.32
Average density of non-Roma → non-Roma nominations (SD)	5.54% (2.29%)	6.52% (2.89%)	2.01% (2.15%)	2.08% (2.36%)	5.30% (3.76%)	6.36% (3.79%)	1.27% (1.41%)	1.79% (1.62%)
Average density of non-Roma → Roma nominations (SD)	1.05% (0.76%)	0.88% (1.13%)	0.65% (0.39%)	0.42% (0.56%)	0.96% (0.79%)	0.88% (0.74%)	0.18% (0.18%)	0.17% (0.29%)
Average density of Roma → non-Roma nominations (SD)	1.08% (0.90%)	1.15% (1.01%)	1.41% (2.12%)	0.85% (1.98%)	0.72% (0.73%)	0.72% (0.61%)	0.17% (0.25%)	0.15% (0.29%)
Average density of Roma → Roma nominations (SD)	5.02% (3.64%)	5.52% (3.53)	3.78% (6.80%)	5.76% (11.56%)	2.92% (2.93%)	5.09% (3.99%)	0.30% (0.54%)	2.13% (2.38%)

Note: average densities of inter- and intra-ethnic nominations are calculated based on self-declared ethnic identification of students

4.4.1. The Quality of Intra- and Interethnic Friendships

Tables 16-19 present the comparison of the quality of inter- and intra-ethnic friendships in the second wave of the research. In Tables 16 and 17, senders' and receivers' self-declared ethnicity have been taken into account. In Tables 18 and 19, senders' ethnic self-identification and peer perceptions on receivers' ethnicity have been included in the analysis.

We expected that interethnic friendship nominations are less often reciprocated than intra-ethnic ones (Hypotheses 1). Including self-declared ethnicity in the analysis, we found that in line with our hypothesis, nominations from Roma towards Roma and from non-Roma towards non-Roma students are more often reciprocated, than nominations from Roma towards non-Roma and from non-Roma towards Roma. Whereas every second Roma–Roma and non-Roma–non-Roma nominations are reciprocated, only 39.54% of Roma–non-Roma and 41.27% of non-Roma–Roma nominations are mutual regarding the whole subsample. Chi-squared test shows statistically significant difference between inter- and intra-ethnic friendship nominations with regard to mutuality ($p < 0.001$).

Including peer perceptions of receivers' ethnicity in the analysis, the results slightly change. Although chi-squared test again shows statistically significant difference between inter- and intra-ethnic friendship nominations with regard to mutuality ($p < 0.01$), the proportion of reciprocated friendship nominations from non-Roma towards Roma becomes higher (51.24%) than the proportion of mutual ties among non-Roma students. (48.31%). Those relations, thus, where Roma students are the receiver of the ties, are more often mutual, than ties sent to non-Roma students, independently of the ethnicity of the sender of the nomination. From another perspective, outgoing nominations of non-Roma students are slightly more often reciprocated by classmates they perceive as Roma than by classmates they perceive as non-Roma.

We also expected that interethnic friendship nominations are less frequently characterized by a co-occurring trust nomination than intra-ethnic ones (Hypothesis 2). Analysing both self-declared ethnicity and ethnic classification of peers we indeed found that compared to cross-ethnic friendship nominations, higher proportion of same-

ethnic nominations occur together with an outgoing trust nomination (36.14% and 32.79% compared to 18.63% and 22.22% in Tables 16 and 17; 44.27% and 30.83% compared to 17.29% and 28.10% in Tables 18 and 19). The main difference is that if we include peer perceptions of receivers' ethnicity in the analysis, the proportion of outgoing friendship ties co-occurring with an outgoing trust tie is higher in the case of Roma receivers (with 8.13 and 5.88 percentage points for Roma–Roma and non-Roma–Roma nominations, respectively) and lower in the case on non-Roma receivers (with 1.96 and 1.34 percentage points for non-Roma–non-Roma and Roma–non-Roma nominations, respectively) compared to the analysis of receivers' self-declared ethnicity. Chi-squared test shows statistically significant difference between inter- and intra-ethnic friendship nominations with regard to co-occurring trust nominations examining both self-identification and peers' ethnic perceptions ($p < 0.001$).

We hypothesized that nominated interethnic friends are less frequently perceived helpful than intra-ethnic ones (Hypothesis 3). In line with this expectation, friendship nominations towards co-ethnic peers more often co-occur with an outgoing perceived helpfulness nomination than cross-ethnic friendship nominations, analysing both self-declared and perceived ethnicity (39.46% and 40.28% compared to 28.90% and 28.97% in Tables 16 and 17; 48.62% and 38.35% compared to 24.50% and 32.23% in Tables 18 and 19). If we include peer perceptions of ethnicity in the analysis, however, the proportion of friendship ties co-occurring with a perceived helpfulness nomination is higher in all types of dyads (with 9.16, 1.93 and 2.76 percentage points) except the non-Roma–non-Roma dyads (where it is smaller with 3.26 percentage points), compared to examining ethnic self-identification. Chi-squared test shows statistically significant difference between inter- and intra-ethnic friendship nominations with regard to co-occurring perceived helpfulness nominations examining both self-identification and peers' ethnic perceptions ($p < 0.001$).

Finally, we expected that interethnic friendship nominations are less frequently characterized by a co-occurring jointly spent spare time nomination than intra-ethnic ones (Hypothesis 4). Analysing both self-declared and perceived ethnicity we found that the proportion of friendship nominations co-occurring with an outgoing jointly shared spare time nomination is indeed higher in intra-ethnic dyads than in interethnic ones (18.07% and 23.89% compared to 11.79% and 13.89% in Tables 16 and 17; 20.16%

and 22.46% compared to 11.53% and 15.70% in Tables 18 and 19). There are only negligible differences in the results if we include perceived ethnicity compared to self-declared ethnicity (1-2 percentage points difference in every type of dyads). Chi-squared test shows statistically significant difference between inter- and intra-ethnic friendship nominations with regard to co-occurring jointly spent spare time nominations examining both self-identification and peers' ethnic perceptions ($p < 0.001$). In the case of Roma students, however, the difference between outgoing inter- and intra-ethnic nominations regarding the proportion of co-occurring jointly spent spare time nominations is larger if we include peer perceptions of receivers' ethnicity compared to ethnic self-identification (8.63 percentage points compared to 6.28 percentage points). In the case of outgoing nominations of non-Roma students, however, the difference is smaller if we include ethnic peer perceptions (6.76 percentage points compared to 10 percentage points). This association also holds in the case of reciprocated nominations as well as taking into account the proportion of co-occurring trust and perceived helpfulness relations.

Table 16. Analysis of interethnic nominations based on self-declared ethnicity of students (T2)

Class ID	Roma → Roma					non-Roma → non-Roma				
	Number of friendship nominations	% of reciprocated nominations	% of co- occurring trust nominations	% of co- occurring perceived helpfulness nominations	% of co- occurring jointly spent spare time nominations	Number of friendship nominations	% of reciprocated nominations	% of co- occurring trust nominations	% of co- occurring perceived helpfulness nominations	% of co- occurring jointly spent spare time nominations
2100	55	56.36%	52.73%	52.73%	14.55%	22	81.82%	54.55%	59.09%	36.36%
2200	27	70.37%	74.07%	70.37%	18.52%	49	73.47%	44.90%	55.10%	34.69%
2400	21	52.38%	42.86%	47.62%	28.57%	87	59.77%	19.54%	26.44%	12.64%
2800	67	59.70%	22.39%	28.36%	17.91%	15	53.33%	26.67%	40.00%	26.67%
3300	21	23.81%	38.10%	47.62%	14.29%	114	28.07%	14.91%	22.81%	10.53%
3400	2	50.00%	50.00%	0.00%	0.00%	139	44.60%	33.09%	46.76%	25.18%
4400	18	55.56%	22.22%	38.89%	16.67%	118	59.32%	62.71%	73.73%	42.37%
5200	32	28.13%	9.38%	18.75%	3.13%	30	46.67%	6.67%	16.67%	16.67%
5400	11	45.45%	27.27%	27.27%	18.18%	107	44.86%	15.89%	12.15%	9.35%
5600	62	54.84%	29.03%	27.42%	20.97%	3	66.67%	33.33%	33.33%	100.00%
7100	6	50.00%	50.00%	100.00%	66.67%	83	55.42%	26.51%	27.71%	38.55%
7300	6	50.00%	83.33%	50.00%	0.00%	72	50.00%	40.28%	51.39%	12.50%
7400	4	50.00%	50.00%	50.00%	75.00%	82	53.66%	47.56%	54.88%	29.27%
total	332	52.11%	36.14%	39.46%	18.07%	921	50.81%	32.79%	40.28%	23.89%

Table 17. Analysis of intra-ethnic nominations based on self-declared ethnicity of students (T2)

Class ID	Roma → non-Roma					non-Roma → Roma				
	Number of friendship nominations	% of reciprocated nominations	% of co- occurring trust nominations	% of co- occurring perceived helpfulness nominations	% of co- occurring jointly spent spare time nominations	Number of friendship nominations	% of reciprocated nominations	% of co- occurring trust nominations	% of co- occurring perceived helpfulness nominations	% of co- occurring jointly spent spare time nominations
2100	23	39.13%	30.43%	21.74%	8.70%	14	64.29%	57.14%	64.29%	7.14%
2200	16	62.50%	43.75%	50.00%	0.00%	16	62.50%	37.50%	43.75%	25.00%
2400	16	18.75%	0.00%	6.25%	0.00%	12	25.00%	0.00%	16.67%	41.67%
2800	19	52.63%	21.05%	26.32%	10.53%	18	55.56%	33.33%	44.44%	16.67%
3300	14	21.43%	7.14%	28.57%	14.29%	29	10.34%	10.34%	17.24%	0.00%
3400	18	27.78%	16.67%	22.22%	16.67%	9	55.56%	55.56%	22.22%	11.11%
4400	42	52.38%	14.29%	35.71%	21.43%	40	55.00%	32.50%	52.50%	20.00%
5200	22	22.73%	4.55%	13.64%	0.00%	33	15.15%	0.00%	0.00%	0.00%
5400	40	40.00%	7.50%	15.00%	10.00%	32	50.00%	12.50%	15.63%	3.13%
5600	6	33.33%	0.00%	33.33%	50.00%	3	66.67%	33.33%	33.33%	33.33%
7100	16	56.25%	12.50%	50.00%	18.75%	20	45.00%	15.00%	30.00%	25.00%
7300	20	20.00%	45.00%	30.00%	5.00%	8	50.00%	12.50%	25.00%	25.00%
7400	11	54.55%	54.55%	81.82%	18.18%	18	33.33%	33.33%	27.78%	22.22%
total	263	39.54%	18.63%	28.90%	11.79%	252	41.27%	22.22%	28.97%	13.89%

Table 18. Analysis of interethnic nominations based on peer perceptions of classmates' ethnicity (T2)

Class ID	Roma → Roma					non-Roma → non-Roma				
	Number of friendship nominations	% of reciprocated nominations	% of co- occurring trust nominations	% of co- occurring perceived helpfulness nominations	% of co- occurring jointly spent spare time nominations	Number of friendship nominations	% of reciprocated nominations	% of co- occurring trust nominations	% of co- occurring perceived helpfulness nominations	% of co- occurring jointly spent spare time nominations
2100	54	50.00%	50.00%	50.00%	14.81%	27	70.37%	48.15%	55.56%	29.63%
2200	29	68.97%	75.86%	72.41%	17.24%	53	66.04%	39.62%	52.83%	33.96%
2400	14	64.29%	42.86%	50.00%	21.43%	84	57.14%	20.24%	29.76%	14.29%
2800	50	64.00%	30.00%	40.00%	18.00%	20	55.00%	35.00%	50.00%	25.00%
3300	17	47.06%	52.94%	64.71%	23.53%	129	26.36%	13.95%	21.71%	8.53%
3400	2	100.00%	50.00%	0.00%	0.00%	139	44.60%	32.37%	45.32%	24.46%
4400	9	77.78%	44.44%	55.56%	22.22%	143	58.74%	58.74%	69.93%	39.86%
5200	13	30.77%	23.08%	38.46%	7.69%	61	31.15%	3.28%	8.20%	8.20%
5400	4	25.00%	25.00%	25.00%	75.00%	128	44.53%	15.63%	11.72%	8.59%
5600	49	61.22%	32.65%	34.69%	24.49%	4	75.00%	25.00%	25.00%	75.00%
7100	4	25.00%	50.00%	100.00%	25.00%	105	55.24%	25.71%	28.57%	36.19%
7300	4	50.00%	75.00%	50.00%	0.00%	76	50.00%	39.47%	50.00%	14.47%
7400	4	50.00%	75.00%	75.00%	75.00%	95	48.42%	45.26%	52.63%	27.37%
total	253	57.31%	44.27%	48.62%	20.16%	1064	48.31%	30.83%	38.35%	22.46%

Table 19. Analysis of intra-ethnic nominations based on peer perceptions of classmates' ethnicity (T2)

Class ID	Roma → non-Roma					non-Roma → Roma				
	Number of friendship nominations	% of reciprocated nominations	% of co- occurring trust nominations	% of co- occurring perceived helpfulness nominations	% of co- occurring jointly spent spare time nominations	Number of friendship nominations	% of reciprocated nominations	% of co- occurring trust nominations	% of co- occurring perceived helpfulness nominations	% of co- occurring jointly spent spare time nominations
2100	24	41.67%	37.50%	29.17%	8.33%	9	88.89%	77.78%	77.78%	11.11%
2200	14	57.14%	35.71%	42.86%	0.00%	12	91.67%	58.33%	50.00%	25.00%
2400	23	34.78%	13.04%	17.39%	13.04%	15	46.67%	0.00%	0.00%	26.67%
2800	37	59.46%	10.81%	10.81%	13.51%	13	53.85%	23.08%	30.77%	15.38%
3300	18	16.67%	0.00%	16.67%	5.56%	14	7.14%	14.29%	21.43%	7.14%
3400	18	27.78%	16.67%	22.22%	16.67%	9	55.56%	66.67%	44.44%	22.22%
4400	51	52.94%	11.76%	33.33%	19.61%	15	53.33%	20.00%	53.33%	6.67%
5200	42	30.95%	2.38%	9.52%	0.00%	6	0.00%	0.00%	0.00%	0.00%
5400	47	31.91%	10.64%	17.02%	6.38%	11	63.64%	9.09%	27.27%	0.00%
5600	19	31.58%	10.53%	10.53%	21.05%	2	50.00%	50.00%	50.00%	50.00%
7100	18	55.56%	16.67%	55.56%	33.33%	3	0.00%	0.00%	0.00%	33.33%
7300	24	20.83%	54.17%	29.17%	4.17%	5	60.00%	0.00%	20.00%	0.00%
7400	12	50.00%	50.00%	75.00%	16.67%	7	57.14%	57.14%	28.57%	42.86%
total	347	39.77%	17.29%	24.50%	11.53%	121	51.24%	28.10%	32.23%	15.70%

Windzio and Bicer (2013) suggested that ethnic segregation is more pronounced in closer relations than in friendship nominations, because closer ties are more costly than friendship nominations. They also hypothesized that the densities of these costly networks are lower than that of friendship networks. In line with their argument we indeed found that the densities of the trust, perceived helpfulness, and jointly spent spare time nominations are much lower, than the density of the friendship nominations (see Table 14). In Table 20 we also compare the proportion of interethnic nominations in these networks. Examining both ethnic self-declaration and peer perceptions of ethnicity we find that the proportion of interethnic ties are indeed lower in the trust, perceived helpfulness, and jointly spent spare time networks than in the friendship networks across the 13 classrooms.

Table 20. Proportion of interethnic nominations in the given networks based on self-declared ethnicity and peer perception of ethnicity across the 13 classrooms (T2)

	Self-declared ethnicity	Peer perception of ethnicity
Friendship	29.13%	26.22%
Trust	19.92%	17.60%
Perceived helpfulness	22.89%	18.93%
Spending spare time together	19.08%	16.91%

4.5. DISCUSSION

In this study we compared the quality of inter- and intra-ethnic friendships, and examined whether results are different including self-declared ethnic identification of students than including peer perceptions of classmates' ethnicity in the analysis. Based on previous studies we expected that interethnic friendship nominations are less likely to be reciprocated, and to be characterized by co-occurring trust and jointly spent spare time nominations than intra-ethnic ones. We also assumed that nominated interethnic friends are less likely to be perceived helpful than intra-ethnic ones. Moreover, based on the argument of Windzio and Bicer (2013) we examined whether closer relations are more likely to be segregated along ethnic lines than friendship networks.

First, we did a descriptive analysis of data from 13 classes of a Hungarian panel study conducted among Roma and non-Roma secondary school students. We investigated whether there is ethnic segregation in the friendship, trust, and perceived helpfulness

relations and shared activities analysing network matrices of the classes. Second, we examined and tested whether inter- and intra-ethnic friendship nominations differ from each other with regard to the proportion of reciprocated ties, and co-occurring trust, perceived helpfulness, and jointly spent spare time nominations.

Our main finding is that in line with our expectations, interethnic friendship nominations are indeed less often characterized by co-occurring outgoing trust, perceived helpfulness, or jointly spent spare time nominations than intra-ethnic ones. This association holds if we include self-declared ethnicity as well as peer perceptions of ethnicity in the analysis. In the case of Roma students as senders of nominations, however, the difference between outgoing inter- and intra-ethnic nominations regarding these indicators is larger if we include peer perceptions of receivers' ethnicity compared to receivers' ethnic self-identification. In the case of outgoing nominations of non-Roma students, the difference is smaller if we include ethnic peer perceptions in the analysis.

Analysing self-declared ethnicity of both senders' and receivers', we also found that interethnic friendship nominations are less often reciprocated than intra-ethnic ones. In the case of peer perceptions of receivers' ethnicity, however, outgoing nominations of non-Roma students are slightly more often reciprocated by classmates they perceive as Roma than by classmates they perceive as non-Roma. In other words, friendship nominations where Roma students are the receiver of the ties are more often mutual, than ties sent to non-Roma students, independently of the ethnicity of the sender of the nomination.

This phenomenon can be explained by different mechanisms. First, it is possible that friendship nominations sent by non-Roma students towards students they perceive as Roma are slightly more often reciprocated by the receivers than nominations sent towards peers perceived as non-Roma. Second, it is also possible that non-Roma students tend to slightly more often reciprocate friendship nominations they receive from classmates they perceive as Roma, than those they receive from classmates they perceive as non-Roma. Third, it is also possible that the high mutuality between non-Roma and perceived Roma peers is a by-product of other endogenous network formation processes. Future studies should examine tie formations between Roma and

non-Roma students longitudinally to test which one of these mechanisms causes the observed patterns of reciprocity in friendship nominations.

These findings support the expectations that peer perceptions of ethnicity may add valuable insights to the analysis of interethnic relations (Boda and N  ray, 2015; Saperstein, 2006). In this study we explicitly addressed the questions how the selected way of operationalization affects the results and found that the inclusion of peer perceptions of classmates' ethnicity considerably alter the findings compared to including self-declared ethnic identification of students.

Another important finding is that students in the sample tended to nominate very few classmates with whom they do different activities together outside the school (such as doing sport, having private classes, studying, spending spare time, or going home together). Several researchers pointed out that extracurricular activities can provide important mixing opportunities for students of different ethnic background (Crain, 1981; Holland and Andre, 1987; Moody, 2001; Slavin and Madden, 1979). Friendship integration might thus increase if schools could provide more extracurricular activities and attract more students to participate in these programs.

A major limitation of our study is that we were only able to do a cross-sectional analysis. In the first wave, the densities of the networks were too small to draw conclusions regarding the quality of interethnic friendships due to the early date of the data collection at the beginning of the first academic year in secondary education. In the third wave, the number of Roma students dropped significantly in our sample. Future research should investigate the changes in the quality of interethnic friendships over time.

Another limitation is that we only examined the proportion of reciprocated friendship nominations and the proportion of co-occurring trust, perceived helpfulness, and jointly spent spare time nominations without taking into account the dependency among ties and without controlling for students' characteristics (e.g., gender, socio-economic status) and controlling for more complex structural characteristics of the networks. It is possible that not only students' preferences, but other processes of network dynamics (e.g. transitivity, gender homophily) influence the formation of ties among students.

Boda and Néray (2015) controlled for these structural effects and found that friendship nominations were more likely between Roma students than between non-Roma students, but cross-ethnic nominations were not significantly less likely than nominations within the non-Roma group. Similarly, the trust, perceived helpfulness, and jointly shared spare time networks, and their interrelatedness with friendship networks should be more thoroughly analysed in the future.

A third limitation is that data on parents' attitudes were not available. Parental acceptance of interethnic relations influence students' inclinations to befriend peers from ethnic outgroups (Windzio and Bicer, 2013). Moreover, due to status considerations or concerns about cultural transmission, parents from different ethnic groups might accept interethnic friendships of their children differently (Munniksma et al., 2012). Potential differences in the attitudes of Roma and non-Roma parents regarding contact with outgroup members might thus affect their children's inter- and intra-ethnic friendship nominations.

The major novelty of this study is that we not only analysed friendship relations but we were also able to capture the quality of inter- and intra-ethnic friendships with various network items. Moreover, we not only analysed interethnic relations based on self-declared ethnicity of students, but included peer perceptions of classmates' ethnicity in the analysis as well.

5. BULLYING AND VICTIMIZATION AMONG MAJORITY AND MINORITY STUDENTS¹⁶

5.1. INTRODUCTION

Bullying among students of different ethnic background is an extreme form of negative interethnic relations that may have long-lasting negative consequences for both individuals and communities (Hanish and Guerra, 2000; McKenney et al., 2006; Verkuyten and Thijs, 2002). From an individual point of view, adolescence is considered as an important period of identity formation (Erikson, 1968), when ethnic self-identification also develops (Hamm et al., 2005; Hitlin et al., 2006; Phinney, 1993). Being harassed because of one's ethnic affiliation may be particularly detrimental to students' adjustment at this stage of identity development (McKenney et al., 2006).

From the point of view of communities, intergroup contact can lead to negative experiences with members of ethnic outgroups and thus increase intergroup conflict and prejudice, if negative interethnic relations, including bully-victim relations, are more prevalent than positive ones (Pettigrew, 2008; Stark et al., 2013). Therefore, interethnic bullying can undermine the positive effects of formal school desegregation on the social integration of minorities. Hence, it is essential to investigate the relationship between bullying and ethnicity in adolescent communities.

Previous studies on bullying and ethnicity have mostly focused on the questions how often minority youth are victimized or participate in bullying compared to majority students, and which factors contribute to the potential differences between ethnic groups. While several researchers found no significant differences between ethnic majority and minority youth (Abada et al., 2008; Boulton, 1995; Eslea and Mukhtar, 2000; McKenney et al., 2006; Monks et al., 2008; Moran et al., 1993; Siann et al., 1994; Wolke et al., 2001); in other studies, certain ethnic groups proved to be more likely to

¹⁶ This chapter is a revised version of a paper, written together with Zsófia Boda and Judit Pál, that has been submitted for publication.

bully or be victimized than others (Fandrem et al., 2009; Graham and Juvonen, 2002; Hanish and Guerra, 2000; Peskin et al., 2006; Strohmeier et al., 2011; Strohmeier and Spiel, 2003; Verkuyten and Thijs, 2002; Vervoort et al., 2010). Most research, however, did not make an attempt to determine the prevalence of bullying behaviour within and between ethnic groups.

Tolsma and his colleagues (2013) aimed to fill this gap and analysed social network data on dyadic peer nominations applying multilevel p2 models. Dyadic peer nominations enable researchers to differentiate between same-ethnic and cross-ethnic dyads of peers; hence, effects of individual characteristics can be disentangled from effects of dyad characteristics. This way, not only the question ‘Which ethnic groups are more likely to bully/be victimized?’ can be answered, but it can also be investigated whether bullying occurs more often within ethnic groups, or between students of different ethnic background. Tolsma and his colleagues found that interethnic bullying was just as likely as intra-ethnic one in a primary school sample in the Netherlands. With increasing ethnic diversity, however, the frequencies of both inter- and intra-ethnic bullying increased.

The objective of this chapter is to examine the likelihood of bullying within and between ethnic groups. To answer our research question we analyse data from 12 classes of a Hungarian network study conducted among Roma and non-Roma Hungarian secondary school students. Our study is novel in two important ways. First, similarly to Tolsma and colleagues, we analyse dyadic peer nominations on bullying and victimization. Instead of using p2 models, however, we use exponential random graph models (ERGMs, also called p^* models, Lusher et al., 2013; Robins et al., 2007) to analyse our data. ERGMs allow us to investigate the effect of ethnicity of both the nominators and the nominated students, and to take into consideration the same-ethnic or cross-ethnic nature of dyads, while controlling for more complex structural characteristics of the bullying networks of the classes (e.g. the tendency that certain bullies harass the same victims, or that some students are more likely to be victimized than other students, independently from their ethnicity). Although some other studies used ERGMs to investigate the structure of bullying networks of school classes (Espelage et al., 2007; Huitsing et al., 2012; Huitsing and Veenstra, 2012), they have

not concentrated on the effects of ethnicity in their analysis (for an exception see Hooijsma, 2015).

Second, we do not only examine the effect of self-declared ethnicity of the students on bullying, but also include peer classification of ethnicity in our analyses. Ethnic self-identification and classification by others can differ from each other (Ladányi and Szelényi, 2006; Messing, 2014; Telles and Lim, 1998), and perceptions of others' ethnicity may also be relevant when decisions about social relations are made. Boda and Néray (2015) analysed the same database that is used in this paper and found that non-Roma students rejected those classmates whom they perceived as Roma, but this tendency remained hidden if only self-declared ethnicity of students was included in the analysis.

5.2. THEORETICAL BACKGROUND

Various definitions of bullying have been proposed in the literature, and most of them agree that it is characterized by some form of aggressive behaviour (Espelage and Swearer, 2003). According to the most widely referred definition, bullying is a frequent, ill-intentioned, and negative act that occurs between one or more bullies and their victim, and is usually characterized by real or perceived imbalance in power (Olweus, 1993).

Students display different types of aggressive behaviour towards peers. While direct or overt aggression involves a face-to-face and visible verbal or physical act towards individuals with the intention to harm them, indirect or covert aggression, such as gossip or exclusion, does not involve direct confrontation with the victim (Björkqvist et al., 1992; Card et al., 2008; Espelage and Swearer, 2003; Little et al., 2003; Sijtsema et al., 2010). Relational aggression can be seen as a special form of indirect aggression, which refers to the manipulation of one's social relationships (Crick, 1995; Little et al., 2003).

Another typology distinguishes between reactive and proactive aggression. Reactive aggression can be viewed as a defensive response to provocation, while instrumental or proactive aggression can be defined as the learned, strategic use of aggression for

obtaining self-serving outcomes (Dodge and Coie, 1987; Little et al., 2003; Sijtsema et al., 2010). As bullies have status goals in the community (Faris and Ennett, 2012; Sijtsema et al., 2009; Veenstra et al., 2010), bullying is usually identified as instrumental aggression.

Students with certain characteristics are more likely to be victimized than others. Socially and personally vulnerable students, for instance – e.g. disliked and rejected students (Knack et al., 2012; Veenstra et al., 2010), students having few or no friends (Faris and Felmlee, 2014; Hodges and Perry, 1996), students with behavioural problems (van Lier et al., 2012), low self-esteem (Sainio et al., 2012), or other characteristics disdained by the peers (Batsche and Knoff, 1994; Olweus, 1993; Wang et al., 2010) –, are at greater risk of being victimized. Students having high status in the class can also be targets of victimization if aggression is used instrumentally to reach high social status in the class (Faris and Felmlee, 2014). Some students, however, are more likely to be perpetrators than others. Popular students (Cillessen and Mayeux, 2004; Faris and Felmlee, 2014; Juvonen et al., 2003; Rodkin and Berger, 2008; Sijtsema et al., 2009), for example, are more likely to bully their peers than students who are less popular.

5.2.1. Intra- and Interethnic Bullying

Several studies have focused on inter- and intra-ethnic friendships and disliking relations among adolescents (e.g. Boda and Néray, 2015; Rambaran et al., 2015), but less is known about whether bullying is more likely to occur in same- or cross-ethnic peer relations. *Social identity theory* (Tajfel and Turner, 1979) suggests that interethnic bullying is more prevalent than intra-ethnic bullying. As people aim to belong to a group with a positive identity and distance themselves from less desired group memberships, they positively attach to ingroup attributes and establish distinctiveness from other social groups (Tajfel, 1982; Tajfel and Turner, 1979). Moreover, people perceived as similar to the individual along relevant dimensions are categorized as ingroup members; people perceived as dissimilar are considered members of the outgroup. Ethnicity is a salient dimension, differences among ethnic groups are therefore often accentuated. Ingroup favouritism and bias toward outgroup members might thus increase prejudice and tensions among groups (Tajfel, 1982). Prejudice and

ethnic tensions may manifest themselves in discriminative and aggressive behaviour (Allport, 1954), leading to bullying among students.

As bullies aim to gain status and affection in the group (Faris and Ennett, 2012; Faris and Felmlee, 2014; Sijtsema et al., 2009; Veenstra et al., 2010); they often harass peers who are rejected by significant others (Veenstra et al., 2010). Friendship networks in school classes are usually segmented by ethnicity (Baerveldt et al., 2004; Moody, 2001; Mouw and Entwisle, 2006; Quillian and Campbell, 2003). Significant others, whose opinion matters, may therefore belong to the same ethnic group. If same-ethnic friends dislike and reject students from the ethnic outgroup (Boda and N  ray, 2015; Griffiths and Nesdale, 2006; Rodkin et al., 2007), interethnic bullying might be more prevalent than intra-ethnic bullying.

Previous studies found some evidence that positive (e.g. friendship, defending) and negative (e.g. dislike, bullying) networks are interrelated with each other (Berger and Dijkstra, 2013; Huitsing et al., 2014, 2012; P  l et al., 2015; Rambaran et al., 2015). Bullies of the same victims as well as victims of the same bullies tend to like each other (Huitsing et al., 2012) and defend each other over time (Huitsing et al., 2014). These processes suggest that bullying is not an isolated behaviour, but is embedded in group processes and status hierarchies of youths (Huitsing and Veenstra, 2012; Salmivalli et al., 1996). Bullies and victims are members of different subgroups, and students tend to defend peers from their ingroup while bullying members of outgroups (Huitsing et al., 2014; Huitsing and Veenstra, 2012). As ethnicity is a relevant dimension in the formation of ingroups and outgroups, we can expect that bully-victim relations are also influenced by the ethnic belonging of peers. Based on social identity theory and previous research findings on interethnic relations, we expect that *bullying occurs more likely between than within ethnic groups (Hypothesis 1)*.

5.2.2. Ethnic Differences in Bullying and Victimization

Bully-victim relations are usually characterized by imbalance of power (Olweus, 1993). Differences in power also exist between majority and minority groups in society (McKenney et al., 2006; Vervoort et al., 2010). Minority groups often find themselves in a marginalized social and economic position in the society, and have to face

exclusion and discrimination in many areas of life. This marginalized social position of minority groups and the prejudicial attitudes shared by the members of the majority society towards ethnic minorities (Griffiths and Nesdale, 2006; Kézdi and Surányi, 2008) may encourage majority students to bully their minority peers. *Ethnic bullying*, i. e. bullying others based on their ethnic background or identity is a special form of harassment, which may include racist name-calling, social exclusion of minority students or more direct forms of aggressive behaviour (Fandrem et al., 2009; McKenney et al., 2006; Monks et al., 2008; Verkuyten and Thijs, 2002).

Social misfit theory (Wright et al., 1986) suggests that bullying might be especially frequent toward minority students if their cultural norms differ considerably from the dominant culture (Tolsma et al., 2013; Vervoort et al., 2010). Individuals who deviate from the group norm might be rejected by their peers, and rejected students are often target of bullying (Knack et al., 2012; Veenstra et al., 2010). Because ethnicity can serve as a signal for difference (Tolsma et al., 2013; Vervoort et al., 2010), ethnic minority students may be at greater risk of victimization than members of the ethnic majority group. Based on these arguments, we expect that *minority students are more likely to be bullied by majority peers than majority students by minority peers* (*Hypothesis 2*).

5.2.3. Bullying and Ethnic Classification

In recent sociology, ethnic and racial categories are mostly regarded as social constructs (American Sociological Association, 2003; Barth, 1969; Brubaker, 2009). This means that the characteristics people consider salient when defining others and their own ethnic group membership differ across communities and may change over time. As perceptions of ethnicity vary depending on the social and historical contexts, ethnic classification and identification of individuals are not fixed characteristics (Saperstein and Penner, 2012).

Survey results indicate that self-identification and classification by others often provide different information on individuals' ethnicity (Ladányi and Szelényi, 2010, 2006; Messing, 2014; Telles and Lim, 1998). The way ethnicity is perceived by others may depend on lifestyle, social position, and status. High-status individuals integrated in the

majority society, for instance, are less likely to be classified as members of minority groups than low-status individuals (Ladányi and Szelényi, 2006; Saperstein and Penner, 2012).

The discrepancies between the different types of ethnic classification have methodological implications. If we distinguish between the self-declared ethnic identification of students and the ethnic perceptions of classmates, the question arises: which way of measurement is more adequate to capture decisions about interethnic relations? When students select their friends, or when bullies select their victims, are their decisions influenced by the ethnic self-identification of their peers or by their own perceptions about those peers' ethnicity? We argue that not only the self-identification of students but peers' perceptions of the ethnicity of their classmates has also impact on their decisions about social relations (Boda and Néray, 2015).

This argument is in line with the suggestions of social identity theory and social misfit theory as well. As emphasized above, social identity theory claims that individuals who differ from the self are considered outgroup members. Low-status students or students of different cultural background might be thus perceived by the majority students as members of minorities. Social misfit theory argues that students reject peers who deviate from group norms; hence, students perceived as minority students might be more likely to be bullied than majority ones.

We examine the effects of ethnic self-identification and peer perceptions of classmates' ethnicity separately in the analysis. We do not formulate, however, any specific hypothesis regarding the effect of different ethnic classification systems on bullying.

5.3. DATA AND METHOD

5.3.1. Participants

We analysed the second wave of the RECENS secondary school dataset described in Chapter 2. The second wave of the study was chosen based on the prevalence of self-reported and peer-reported bullying behaviour and the percentage of minority students in the classrooms. As the first wave of the research took place a few weeks after the beginning of the academic year, students had little opportunity to get to know each other

during this time. Frequencies of self- and peer-reported bullying and victimization increased to the second and the third waves of the study. Between the second and the third waves, however, we experienced a high dropout-rate of minority students, resulting in a lower number of classrooms with minority students in later waves.

We selected those classrooms where the response rate reached 80%, and where the rate of minority students was at least 10%. Our initial subsample consisted of 17 classrooms. Later, five more classrooms had to be excluded from the analysis due to convergence problems during the analysis (see details Section 5.3.4.). The final subsample comprised 12 classrooms with a mean class size of 29 students ($SD=3.93$). Three classes provided vocational education, eight classes were technical school classes, and only one class was a grammar school class. 211 girls (60.8%) and 136 boys (39.2%) attended these classes. 13.0% of the students were missing in the second wave of the research. 31.1% of the students declared being Roma. 22.2% of the pupils reported the highest education of father being not higher than 8 years of primary education; this is 30.5% for the mothers.

5.3.2. Exponential Random Graph Models

Data were analysed using exponential random graph models (Lusher et al., 2013; Robins et al., 2007) that provide statistical models for social networks. Standard statistical methods (e.g. logistic regression) assume independence among actors and ties; therefore, they cannot model network dependencies. ERGMs explicitly model the dependence among ties by conditioning the likelihood of the presence of a tie on the presence or absence of other ties in the network (Lusher et al., 2013).

In social networks, several underlying social mechanisms (e.g., reciprocity, transitivity, homophily) structure the formation of ties between actors. These processes create local patterns of ties. Such local structures include dyad-based, triad-based, and higher-order level network configurations that are represented by the parameters of the model. An ERGM allows us to make inferences about whether the analysed network comprises significantly more or fewer of the configurations of interest than we would expect by chance. During a simulation process, the model estimates the effects of included parameters on the probability that a tie exists (Lusher et al., 2013).

We found ERGMs suitable to examine bullying among students of different ethnic background, because previous studies indicated that bullying nominations among a set of actors constitute social networks, characterized by certain typical mechanisms of tie formation (Huitsing et al., 2014, 2012; Huitsing and Veenstra, 2012). The effect of ethnicity might be overestimated if we used other types of models that do not control for endogenous structural network processes.

In ERGMs, the possible dyadic pairs of the network represent the binary dependent variable. We code dyads in which student i (sender) nominates student j (receiver) in a network question (e.g. ‘Who do you bully?’; ‘By whom are you being bullied?’) as 1 and dyads where there is no nomination from i to j as 0. Possible independent variables include binary, categorical, and continuous individual attributes, dyadic covariates, and network configurations representing endogenous structural processes of the network.

Although ERGMs are designed to analyse cross-sectional data (however, longitudinal ERGMs also exist), examining the dependencies between network ties allows us to obtain insights about the underlying social processes that drive the dynamics of network formation (Lusher et al., 2013).

5.3.3. Measures

Dependent variables: bullying and victimization. Similarly to other studies (Faris and Felmlee, 2014; Tolsma et al., 2013; Veenstra et al., 2007), we measured the occurrence of bullying behaviour from the perspectives of both the bullies and victims. In Hungarian, the term bullying does not have an unequivocal translation; therefore, we decided to measure the various aspects of bullying behaviour with different questions. On the questionnaire, children saw a list of all classmates and had to put an ‘X’ to those students to whom they felt the statement was right. From the perspective of the perpetrators, students were asked to answer the questions 1. ‘Who did you beat up?’; 2. ‘About whom do you tell bad things to others?’; 3. ‘Who do you mock?’ and 4. ‘Who did you deliberately humiliate?’ For the purpose of analysis, these four items were combined into one variable: a bullying relationship between two classmates was established if a student nominated the other student at least once to any of the above-mentioned four questions. This bullying network was used as the dependent variable in

Model 1. From the perspective of the victims, similarly, we asked 1. *'Who did beat up you?'*; 2. *'Who tells bad things about you to others?'*; 3. *'Who mocks you?'* and 4. *'Who humiliated you deliberately?'* Then, we created a combined victimization variable based on these four items and used as the dependent variable in Model 2 in the same way as described before.

The combination of the different forms of bullying into one variable had both theoretical and methodological reasons. From a theoretical point of view, we were interested in whether bullying in general occurs more frequently between students of different ethnic background, or within ethnic groups. Our purpose was to examine students' experience of bullying in general, rather than to concentrate on the specific subtypes of bullying behaviour. We also argue that bullying relations of students might be characterized by network processes, decisions on whom to bully depending on other students' behaviour. These dependencies, however, not necessarily mean to choose the same type of bullying other classmates do.

From a methodological point of view, sparse networks might encounter convergence problems during the estimation process of exponential random graph models. Networks created solely on fighting and humiliation data proved to be too sparse to be analysed separately. For these reasons, we present descriptive statistics of the single networks as well as of the combined networks separately, but estimate models only for the combined networks. Descriptive statistics of the answers are presented in Table 21.

Missing network data caused by unit non-response were imputed, using data from the first and third waves. If there were valid answers in both waves, we calculated the mean of the two values. Means higher than 0.5 were recoded into 1, means lower than or equal to 0.5 were recoded into 0. If any of the first or third wave data were missing, nomination data were imputed, using the wave when we had valid answers (Boda and Néray, 2015).

Table 21. Descriptive statistics of the different types of bullying networks (based on students' ethnic self-identification)

	Bullies as nominators					Victims as nominators				
	Gossiping	Mocking	Humiliating	Beating	Combined	Gossiping	Mocking	Humiliating	Beating	Combined
Total number of nominations	289	271	102	77	598	195	176	110	17	374
Average density over all classrooms (SD)	2.97% (1.38%)	2.99% (1.68%)	1.09% (0.67%)	0.84% (0.96)	6.38% (2.37%)	2.09% (0.78%)	1.86% (0.98%)	1.13% (0.53%)	0.17% (0.18%)	3.98% (1.29%)
Reciprocity over all classrooms (SD)	1.97% (4.23)	3.04% (4.48%)	1.28% (3.05%)	3.82% (8.01%)	6.67% (4.85%)	6.48% (8.11%)	2.12% (4.04%)	1.67% (5.77%)	14.29% (37.80%)	6.26% (5.48%)
Average in-/outdegree	0.83	0.78	0.29	0.22	1.72	0.56	0.51	0.32	0.05	1.08
Standard deviation indegree	1.23	1.09	0.60	0.58	1.80	0.87	0.88	0.67	0.22	1.34
Standard deviation outdegree	1.73	1.75	0.76	0.91	2.63	1.47	1.36	0.94	0.32	1.97
Average indegree among Roma (SD)	0.70 (0.93)	0.93 (1.08)	0.28 (0.54)	0.29 (0.61)	1.71 (1.58)	0.49 (0.82)	0.44 (0.77)	0.26 (0.58)	0.05 (0.22)	0.98 (1.17)
Average outdegree among Roma (SD)	0.92 (1.71)	0.96 (2.25)	0.43 (0.74)	0.18 (0.50)	1.95 (2.81)	0.68 (1.66)	0.60 (1.51)	0.31 (0.86)	0.07 (0.39)	1.39 (2.16)
Average indegree among non-Roma (SD)	0.88 (1.33)	0.73 (1.09)	0.30 (0.63)	0.20 (0.57)	1.73 (1.88)	0.59 (0.89)	0.53 (0.93)	0.34 (0.70)	0.05 (0.21)	1.12 (1.39)
Average outdegree among non-Roma (SD)	0.80 (1.73)	0.71 (1.52)	0.27 (0.77)	0.24 (1.02)	1.64 (2.55)	0.52 (1.39)	0.47 (1.30)	0.32 (0.97)	0.04 (0.29)	0.96 (1.88)
Number of non-Roma → non-Roma nominations	143	120	43	39	275	98	91	65	7	188
Number of non-Roma → Roma nominations	68	31	16	5	108	54	48	27	2	94
Number of Roma → non-Roma nominations	60	73	32	19	138	29	10	13	3	47
Number of Roma → Roma nominations	18	47	11	14	77	14	27	5	5	45
Average proportion of interethnic nominations over all classrooms (SD)	47.15% (18.06%)	43.54% (21.05%)	40.23% (25.93%)	50.00% (23.12%)	43.60% (15.45%)	44.35% (17.72%)	30.82% (15.53%)	38.07% (24.30%)	20.24% (34.65%)	39.11% (14.60%)

Ethnicity. In the present study we distinguish between self-declared ethnicity and perceived ethnicity, measured by the ethnic classification made by the students' classmates. First, self-identification of the pupils was included in the models to measure self-declared ethnicity. Students were asked to classify themselves as 'Hungarian', 'Roma', 'both Hungarian and Roma', or members of 'another ethnicity'. We recoded students belonging to the 'Hungarian' or 'other ethnicity'¹⁷ as non-Roma (N=239), and students belonging to the 'Roma' or 'both Roma and Hungarian' category as Roma (N=108).

As some students tended to change their self-declared ethnicity between the Roma and non-Roma categories from one wave to the next (2.88%, 2.31% and 0.29% between the consecutive waves, respectively), missing cases were imputed according to the following procedure. First, data from other waves were imputed for those students who identified themselves as Roma or non-Roma in any other wave, and did not reported belonging to the other ethnicity in another wave. For one student, who indicated to be Roma in the first wave and Hungarian in the third, we imputed the data from the first wave because it was much closer in time to the second wave. Second, in the case of the remaining 10 missing cases we could not impute ethnicity based on self-declaration. Therefore, as the best predictor of Roma self-identification, we calculated the ratio of classmates who classified these students as Roma in the second wave. If the ratio was greater than 50% (one student belonged to this category with 56%), students' ethnicity was recoded as Roma. If the ratio was less than 50% (ranging from 0% to 9%), students' ethnicity was recoded as non-Roma.









Second, we included the classification made by peers as the measure of perceived ethnicity in the models. Students were provided a list of all classmates and they should nominate whom they consider Roma. Thus, we have a Roma perception network, where, for each dyadic relation, 1 indicates that the respondent (sender) classified the

¹⁷ Nine students indicated to belong to another ethnicity. As one of them declared herself to be both Hungarian from Romania and Roma, her answer was recoded as Roma. The answers of the other eight students, who reported to be American, Arab, or members of a European nationality, were recoded as non-Roma.

given classmate (receiver) as Roma, and 0 indicates that the respondent did not consider the receiver Roma. Missing nomination data caused by unit non-response were imputed in the same way as bullying nomination data, described above.

In ERGMs, attribute effects (e.g. gender, ethnicity, and SES of the students) are usually captured by three separate types of parameters; one measures the effect of the sender (who makes the nomination) in the dyad, another one measures the effect of the receiver (who is nominated), and a third one measures the interaction between the sender and receiver (in the case of categorical variables), or the difference (in the case of continuous variables) between the two actors. In Model 1A and 2A, self-declared ethnicity of the sender and receiver, and the interaction between these two variables were included. In Model 1B and 2B, the self-declared ethnicity of the sender was included. Instead of the self-declared ethnicity of the receiver, however, we used the Roma perception network 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 1C and 2C, the self-declared ethnicity of the sender and receiver, the perceived ethnicity of the receiver, and the interactions between these variables were included. Table 22 graphically represents the parameters measuring the effects of self-declared and perceived ethnicity of the receiver in our models.

Table 22. Parameters measuring the effects of self-declared and perceived ethnicity of the receiver in the ERG models

	Self-declared ethnicity of receiver			Perceived ethnicity of receiver		
Reference category	0	0		0	0	
	Non-Roma	Non-Roma		Non-Roma	Non-Roma	
Roma Sender	1	0		1	0	
	Roma	Non-Roma		Roma	Non-Roma	
Roma Receiver	0	1		0	1	
	Non-Roma	Roma		Non-Roma	Roma	
Roma Interaction	1	1		1	1	
	Roma	Roma		Roma	Roma	

Control variables. In the analysis, we controlled for gender and socio-economic status of both the sender and receiver. Gender homophily and difference in socio-economic status of the pairs were also included. Previous research indicates that gender plays a crucial role in the structure of bullying relations in classrooms. Comparing to girls, boys are usually more likely to bully their peers (Card et al., 2008; Juvonen et al., 2003; Rodkin and Berger, 2008; Salmivalli et al., 1996; Tolsma et al., 2013; Veenstra et al., 2007), and this gender difference is especially pronounced if physical aggression is under investigation. Girls are more likely to use indirect, relational forms of bullying such as gossip and exclusion (Card et al., 2008; Olweus, 1993).

Socio-economic status of students may also be a relevant factor in the explanation of bullying and victimization (Tippett and Wolke, 2014). Furthermore, SES is often associated with the minority status of pupils, so it is particularly important to control for it if ethnicity is in the focus of the research. In the questionnaire, we included several questions with the aim to measure the family background of students. In ERGMs, however, every attribute based effect is usually captured by three separate parameters. As we wanted to avoid including too many parameters in our model, we decided to capture students' socio-economic status with one indicator.

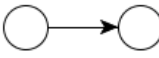
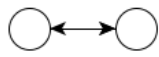
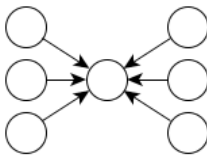
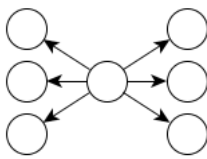
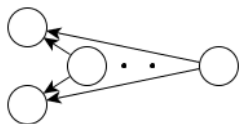
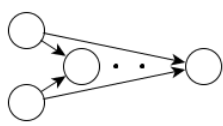
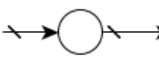
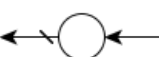
Thus, we calculated SES scores from the mother's highest education and the number of books families have at home, using categorical principal component analysis (CATPCA, Linting et al. 2007). Mother's highest education was measured with 7 categories: 1. fewer than 8 years of primary school, 2. primary school, 3. vocational school, 4. secondary technical school, 5. secondary grammar school, 6. college (BA), and 7. university (MA). The variable measuring the number of books families have at home was categorised into 6 categories as 1. 0-10 books, 2. 11-25 books, 3. 26-100 books, 4. 101-200 books, 5. 201-500 books, and 6. more than 500 books. The two variables loaded on a principal component explaining 80.3 % of the variance. Missing data on the variables measuring the mother's education and the number of books were imputed, using data from the other waves. For those cases where imputation could not be implemented and CATPCA scores could not be calculated, we imputed the missing SES scores using regression imputation method. We estimated SES scores using the mean SES of class and self-declared ethnicity of the students as explanatory variables (Adjusted $R^2=0.589$).

Structural effects. Previous studies revealed several characteristics of tie formation in bullying networks of school classes. Besides the afore-mentioned attribute effects, we aimed to control for these structural effects in our models. The ‘isolate’ parameter describes those students who neither participate in bullying as perpetrators nor report being victimized. The ‘sink’ parameter (at least one in-tie, zero out-tie), on the one hand, represents students who do not bully others, but are reported being victimized by peers (in the models from the perspective of the bullies). On the other hand, it represent students who indicate being victimized, but do not report to bully others (in the models from the perspective of the victims). As a considerable percentage of students belonged to each of these three groups in previous studies, we decided to include the isolate and sink parameters in our models (Huitsing et al., 2014, 2012; Huitsing and Veenstra, 2012; Salmivalli et al., 1996).

Some bullies report to harass the same victims and some bullies are nominated as bullies by the same victims. Similarly, some victims report to be bullied by the same classmates and some victims are nominated to be harassed by the same bullies (Card and Hodges, 2006; Huitsing et al., 2014, 2012; Huitsing and Veenstra, 2012). These tendencies are represented by the ‘shared in-ties’ and ‘shared out-ties’ parameters in the models.

The ‘out-ties spread’ and ‘in-ties spread’ parameters model that some students report to be and are nominated more frequently as victims or bullies than others. These parameters are also included in the models to take into account the differences in the number of ties sent and received in the bullying and victimization networks.

Table 23. Description and graphical representation of the structural and attribute-based network parameters

Parameter	MPNet name	Description	Graphical representation
Arc	<i>arc</i>	Occurrence of nominations	
Reciprocity	<i>reciprocity</i>	Occurrence of reciprocated ties	
In-ties spread	<i>A-in-S</i>	Dispersion of in-ties distribution	
Out-ties spread	<i>A-out-S</i>	Dispersion of out-ties distribution	
Shared in-ties	<i>A2P-D</i>	Structural equivalence based on in-ties (being nominated by the same students)	
Shared out-ties	<i>A2P-U</i>	Structural equivalence based on out-ties (nominating the same students)	
Isolate	<i>isolate</i>	Occurrence of isolated students	
Sink	<i>sink</i>	Occurrence of students with zero outdegree and at least one indegree	

5.3.4. Analytical Strategy

To estimate our ERG models, we used the MPNet program¹⁸ (Wang et al., 2014) with the one-mode network option. 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. The model converges if the absolute value of the t-ratio is lower than 0.1 for all parameters included in the model. The sample autocorrelation factor (SACF) of the statistics can be tolerated if its absolute value does not exceed 0.4 (Lusher et al., 2013).

After convergence is reached, the Goodness of Fit (GOF) measures of the models are assessed. Through a simulation process, the GOF procedure shows how the estimated model describes characteristics of the networks that were not explicitly modelled with the included configurations. GOF 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 et al., 2013).

The estimation procedure was similar as described by Huitsing et al. (2012). We aimed to find a relatively low number of configurations that represent the structure of bullying networks in all of our classes. We estimated ERG models with the configurations described in Section 5.3.3. for each classes separately. After convergence was reached for all classes, we checked whether the sample autocorrelation factors were lower than 0.4 and assessed the GOF statistics of the models. If SACF exceeded 0.4, we increased the multiplication factor (Lusher et al., 2013). If GOF procedure yielded t-ratios higher than 2, we included other parameters to reach a better fit of the model. Those parameters that proved to be nonsignificant in the majority of the classes were removed from the analysis, if the models converged and GOF statistics were satisfactory without them as well. Finally, we meta-analysed the parameters and the standard errors of the separate models based on the procedure described by Snijders and Baerveldt (2003). We

¹⁸ The program is available at www.sna.unimelb.edu.au/PNet.

tested whether the values of the parameters significantly differed from 0, indicating general tendencies in the networks.

5.4. RESULTS

5.4.1. Prevalence of Bullying

Students were more likely to report that they bully their peers than to report being bullied. This tendency is observable among boys as well as among girls, and among both Roma and non-Roma students (see Table 24 for details). On average, students nominated almost 2 classmates they bully, and 1 student by whom they are bullied. Overall in the 12 classes, there were 629 nominations made by the bullies, 6.55% of all possible ties. Victims reported 374 bullying relations, 3.98% of all possible ties. In 175 cases, there was an agreement between the self-reported bullies and victims that a bully-victim relation indeed existed. Examining the different types of bullying behaviour, gossiping about the classmates and mocking them occurred more frequently than humiliation and physical aggression (see Table 26 for details). According to the bullies, 43.6% of the bullying relations were between students of different ethnic background based on self-declared ethnicity of the students. According to the victims, they were bullied by a student of a different ethnicity in 39.1% of the cases.

Table 24. Descriptive statistics of bullying and victimization among non-Roma, Roma, boys, and girls

	Total		Non-Roma		Roma		Girls		Boys	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Self-reported bullying	1.73	2.63	1.61	2.51	1.99	2.86	1.78	2.56	1.65	2.75
Nominated bullying	1.08	1.34	0.98	1.31	1.29	1.37	1.08	1.40	1.07	1.24
Self-reported victimization	1.08	1.97	1.18	2.06	0.85	1.73	1.18	2.01	0.93	1.90
Nominated victimization	1.72	1.80	1.72	1.82	1.71	1.76	1.56	1.81	1.97	1.76

Note: Difference in group means between Roma and non-Roma students is only significant for nominated bullying ($p < 0.05$). Difference in group means between girls and boys is only significant for nominated victimization ($p < 0.05$).

Table 25 presents the correlations between different measures of bullying and victimization. As we measured bullying from the perspectives of both the bullies and victims, we can differentiate between self-reported and nominated bullying and victimization. Self-reported bullying and victimization are measured by the outgoing

nominations (outdegree) in the bullying and victimization network, respectively. Nominated victimization is captured with the received nominations (indegree) in the bullying network, whereas nominated bullying is measured by the received nominations (indegree) in the victimization networks.

Among non-Roma students, there is a significant moderate positive correlation between self-reported victimization and nominated victimization ($r=0.356$, $p<0.01$). Correlation between self-reported bullying and nominated bullying is weaker but statistically significant ($r=0.222$, $p<0.01$). Among Roma students, there is a weak positive correlation between self-reported and nominated victimization ($r=0.203$, $p<0.05$), but there is no statistically significant correlation between self-reported and nominated bullying. Among both Roma and non-Roma students, there is a moderate correlation between nominated bullying and victimization ($r=0.397$, $p<0.01$ in both groups), and between self-reported bullying and victimization ($r=0.527$ for Roma; $r=0.449$ for non-Roma, $p<0.01$), suggesting that students who are more likely to be involved in bullying as bullies or victims are also more likely to be involved in the other role as well.

Table 25. Correlations between self-reported and nominated bullying and victimization

	(1)	(2)	(3)	(4)
(1) Self-reported bullying	-	0.222**	0.449**	0.113
(2) Nominated bullying	0.077	-	-0.027	0.397**
(3) Self-reported victimization	0.527**	0.132	-	0.356**
(4) Nominated victimization	0.085	0.397**	0.203*	-

Note: Correlations for non-Roma above and for Roma below the diagonal, * $p<0.05$, ** $p<0.01$.

5.4.2. Meta-analysis of Exponential Random Graph Models

Table 26 presents the results of the meta-analysis of the separate ERGMs based on the nominations reported by the bullies. The results obtained from the analysis of victims' nominations are shown in Table 27. In Model 1A and 2A, we included the self-declared ethnicity of the students; in Model 1B and 2B, we used dyadic peer nominations representing peers' perceptions of their classmates' ethnicity. In Model 1C and 2C, both self-identification and peers' perceptions were taken into account. The 'isolate' and 'sink' parameters were removed from the final models because they did not have a significant effect in the majority of the classes, and all models converged without these parameters as well. In 2 and 4 classes (in Model 1 and 2, respectively), however, the 'reciprocity' parameter had to be included to achieve acceptable Goodness of Fit statistics.

If we use MPNet, those parameters, which are not present in our observed networks, cannot be included and estimated in the ERG models. In some classes, therefore, some attribute-based parameters have been removed from the models. In those classes, where there were no nominations between boys, for instance, the boy interaction parameter could not be estimated. In the victimization models, the shared in-ties and shared out-ties parameters were left out from the model in one class, because including them caused convergence problems.

For each class, all of our models converged for every parameters based on the convergence criterium ($t\text{-ratio} < |0.1|$). For each parameter, moreover, the value of the sample auto-correlation factor was lower than 0.4. For almost all included parameters, the value of the GOF t -ratio was below 0.1, and it was below 0.12 for all of them. For almost all non-included parameters, the value of the GOF t -ratio was below 2, and it was below 2.8 for all of them. Occasionally, however, higher values than 2 are tolerable (Lusher et al., 2013).

Table 26. Meta analysis of the exponential random graph models based on bullies' nominations

Self-Reported Bullying Networks	Model 1A					Model 1B					Model 1C					N
	Est	SE		σ	Q	Est	SE		σ	Q	Est	SE		σ	Q	
<i>Structural parameters</i>																
Arc	-4.749	0.221	***	0.490	13.617	-4.815	0.196	***	0.397	12.257	-4.782	0.203	***	0.382	11.198	12
Reciprocity	1.213	0.342	***	0.087	1.033	1.204	0.339	***	0.028	1.004	1.208	0.334	***	0.080	1.029	2
In-ties spread (AinS)	0.462	0.123	***	0.000	11.238	0.463	0.120	***	0.000	11.297	0.453	0.126	***	0.000	11.163	12
Out-ties spread (AoutS)	1.040	0.130	***	0.203	14.134	1.014	0.136	***	0.244	15.380	1.015	0.138	***	0.245	15.066	12
Shared in-ties (A2P-D)	0.173	0.017	***	0.000	12.543	0.169	0.016	***	0.000	13.607	0.172	0.017	***	0.000	12.718	12
Shared out-ties (A2P-U)	0.148	0.047	**	0.090	23.701	0.173	0.045	***	0.086	25.039	0.143	0.052	**	0.110	23.119	12
<i>Roma ethnicity</i>																
Roma Sender	0.062	0.136		0.291	12.872	0.088	0.122		0.285	12.290	0.077	0.126		0.238	12.906	12
Roma Receiver (self-declared)	-0.017	0.202		0.479	16.807						-0.283	0.222		0.480	17.351	12
Roma Sender*Receiver (self-declared)	-0.170	0.366		0.708	12.167						0.059	0.368		0.423	14.021	9
Roma Receiver (peer perceived)						0.418	0.169	*	0.000	11.955	0.514	0.244	*	0.415	13.613	12
Roma Sender*Receiver (peer perceived)						-0.142	0.329		0.000	9.206	-0.096	0.577		0.782	10.858	7
<i>Control variables</i>																
Boy Sender	-0.828	0.157	***	0.155	10.259	-0.803	0.151	***	0.121	10.417	-0.809	0.162	***	0.175	10.613	10
Boy Receiver	-0.440	0.128	***	0.000	8.107	-0.412	0.126	**	0.000	7.314	-0.419	0.128	***	0.000	9.213	11
Boy Sender*Receiver	1.645	0.397	***	0.833	12.256	1.637	0.417	***	0.912	12.973	1.616	0.431	***	0.947	13.965	8
SES Sender	0.072	0.039		0.000	7.444	0.068	0.040		0.000	7.461	0.074	0.041		0.000	7.212	12
SES Receiver	0.082	0.139		0.416	29.858	0.101	0.099		0.268	19.294	0.086	0.138		0.407	27.895	12
SES Difference	0.065	0.064		0.035	12.607	0.049	0.063		0.000	10.328	0.070	0.066		0.027	11.342	12

Note: Estimated parameters, estimated standard errors, estimated between-classroom standard deviations, test statistics of between-classroom difference, number of classrooms. *p<0.05, **p<0.01, ***p<0.001

Table 27. Meta analysis of the exponential random graph models based on victims' nominations

Self-Reported Victimization Networks	Model 2A					Model 2B					Model 2C					N
	Est	SE	σ	Q		Est	SE	σ	Q		Est	SE	σ	Q		
<i>Structural parameters</i>																
Arc	-4.621	0.179	***	0.093	11.621	-4.701	0.199	***	0.299	11.623	-4.699	0.223	***	0.410	12.653	12
Reciprocity	1.239	0.451	**	0.359	3.468	1.279	0.464	**	0.471	3.499	1.309	0.464	**	0.445	3.701	4
In-ties spread (AinS)	0.402	0.168	*	0.000	4.229	0.519	0.163	**	0.000	7.820	0.447	0.166	**	0.000	5.050	12
Out-ties spread (AoutS)	1.079	0.140	***	0.077	11.108	1.086	0.139	***	0.000	9.876	1.098	0.142	***	0.000	9.463	12
Shared in-ties (A2P-D)	0.174	0.024	***	0.000	6.737	0.171	0.025	***	0.000	7.203	0.161	0.028	***	0.000	6.541	11
Shared out-ties (A2P-U)	0.201	0.050	***	0.000	9.966	0.177	0.057	**	0.000	11.064	0.181	0.057	**	0.000	10.623	11
<i>Roma ethnicity</i>																
Roma Sender	-0.198	0.150		0.000	7.002	-0.097	0.129		0.090	9.711	-0.256	0.163		0.000	8.971	12
Roma Receiver (self-declared)	0.192	0.311		0.820	16.904						-0.216	0.303		0.673	15.190	12
Roma Sender*Receiver (self-declared)	0.586	0.360		0.000	7.472						0.838	0.436		0.000	4.107	9
Roma Receiver (peer perceived)						0.720	0.203	***	0.000	12.935	0.751	0.237	**	0.000	10.601	12
Roma Sender*Receiver (peer perceived)						0.666	0.626		1.331	14.836	0.065	0.821		1.666	12.448	10
<i>Control variables</i>																
Boy Sender	-0.569	0.158	***	0.000	12.192	-0.585	0.164	***	0.000	9.999	-0.564	0.161	***	0.000	11.445	11
Boy Receiver	-0.539	0.287		0.635	11.690	-0.560	0.283		0.618	10.404	-0.507	0.281		0.596	11.128	10
Boy Sender*Receiver	1.781	0.412	***	0.474	6.422	1.761	0.380	***	0.278	4.876	1.761	0.376	***	0.000	5.784	8
SES Sender	0.142	0.102		0.267	16.096	0.183	0.113		0.307	18.284	0.169	0.115		0.310	17.458	12
SES Receiver	0.184	0.099		0.140	9.980	0.184	0.095		0.159	10.743	0.200	0.108		0.189	10.753	12
SES Difference	-0.083	0.097		0.125	8.288	-0.084	0.090		0.065	8.000	-0.069	0.097		0.105	8.218	12

Note: Estimated parameters, estimated standard errors, estimated between-classroom standard deviations, test statistics of between-classroom difference, number of classrooms. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The negative arc parameter reflects the low density of the bullying nominations. All other structural parameters included in the models are consistently significant and positive in the different types of models. The positive in-ties spread and out-ties spread parameters indicate that some students are more frequently bullied than their peers, and some students bully more peers than other classmates. The positive shared in-ties and shared out-ties parameters represent that some victims are harassed by the same bullies. The reciprocity parameter had to be included in some classes to obtain a better fit of the model. In these classes, students tend to reciprocate bullying nominations. In other classes, however, the percentage of mutual nominations was low, in some classes even zero.

We expected that bullying occurs more likely between than within ethnic groups (Hypothesis 1). Thus, we assumed that Roma–non-Roma and non-Roma–Roma nominations are more likely than Roma–Roma and non-Roma–non-Roma nominations. The difference between interethnic nominations and non-Roma–non-Roma nominations are directly modelled in our analysis with the Roma sender and receiver/perception parameters. We also calculated the conditional odds ratios for each kind of dyads compared to the non-Roma–non-Roma reference category (see Tables 28 and 29). The parameters in Table 26 and the conditional odds ratios in Table 28 show that, consistently with our hypothesis, non-Roma students are more likely to report that they bully peers they perceive as Roma, than to bully peers they perceive as non-Roma (OR=1.519, $p<0.05$ in Model B, Table 28; OR=1.673, $p<0.05$ for non-Roma – “only perceived” Roma nominations in Model C, Table 28). From the perspective of the victims, non-Roma students are more likely to report that they are bullied by a classmate they perceive as Roma, than by a classmate they perceive as non-Roma (OR=2.055, $p<0.001$ in Model B, Table 29; OR=1.706, $p<0.01$ for non-Roma – “consistent” Roma and OR=2.118, $p<0.01$ for non-Roma – “only perceived” Roma nominations in Model C, Table 29). Roma–non-Roma nominations, however, are not significantly more likely than non-Roma–non-Roma nominations in any of our models. Similarly, cross-ethnic nominations are not more likely to occur than nominations between non-Roma students if ethnicity is measured as self-identification.

Table 28. The effect of ethnicity on bullying based on bullies' nominations

		Receiver's ethnicity		
	Sender's ethnicity	Non-Roma	Roma	
Model A	Non-Roma	1,000	0,983	
	Roma	1,064	0,883	
Model B	Non-Roma	1,000	1,519*	
	Roma	1,092	1,438**	
			"consistent" Roma (both perceived and self-declared)	Only self-declared Roma Only perceived Roma
Model C	Non-Roma	1,000	1,261	0,754 1,673*
	Roma	1,080	1,312	0,864 1,641*

Conditional odds ratios are presented, reference category: non-Roma–non-Roma nominations. * $p < 0.05$, ** $p < 0.01$

Table 29. The effect of ethnicity on bullying based on victims' nominations

		Receiver's ethnicity		
	Sender's ethnicity	Non-Roma	Roma	
Model A	Non-Roma	1,000	1,212	
	Roma	0,821	1,786	
Model B	Non-Roma	1,000	2,055***	
	Roma	0,908	3,631***	
			"consistent" Roma (both perceived and self-declared)	Only self-declared Roma Only perceived Roma
Model C	Non-Roma	1,000	1,706**	0,805 2,118**
	Roma	0,774	3,258*	1,442 1,749

Conditional odds ratios are presented, reference category: non-Roma–non-Roma nominations. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The difference between cross-ethnic nominations and Roma–Roma nominations are not directly modelled in our analysis. Therefore, we calculated additional Wald-tests to see whether non-Roma–Roma and Roma–non-Roma nominations are more likely than nominations between Roma students. The results of the tests show that contrary to our expectations, Roma students are more likely to report that they are bullied by classmates they perceive as Roma, than by classmates they perceive as non-Roma. From the perspective of the bullies, however, Roma–non-Roma nominations are not significantly more likely, than Roma–Roma nominations. Based on the results of the Wald-test, non-Roma–Roma nominations are not significantly more likely than nominations between Roma students in any of our models. Similarly, self-declared ethnicity does not seem to

have a significant effect on bullying controlling for the other parameters included in our analysis.

We also expected that minority students are more likely to be bullied by majority peers than majority students by minority peers (Hypothesis 2). In other words, we expected that from the perspective of the bullies, non-Roma–Roma nominations are more likely than Roma–non-Roma nominations, whereas from the perspective of the victims, Roma–non-Roma nominations are more likely than non-Roma–Roma nominations. As this difference is not directly modelled in our analysis, we ran additional Wald-tests to test this assumption. Based on nominations from bullies' perspective, non-Roma–Roma nominations are not significantly more likely to occur than Roma–non-Roma nominations. Based on nominations from victims' perspective, however, non-Roma students are more likely to report that they are bullied by classmates they perceive as Roma, than Roma students to report that they are bullied by classmates they perceive as non-Roma. Self-declared ethnicity does not have a significant effect on bullying in any of our models.

The conditional odd ratios suggest, moreover, that compared to the odds of the non-Roma–non-Roma nominations, Roma students are significantly more likely to report that they are bullied by peers who are consistently classified as Roma (OR=3.258, $p<0.05$, Table 29). In contrast, they are significantly more likely to report that they bully peers they perceive as Roma, but who do not identify themselves as Roma (OR=1.641, $p<0.05$, Table 28).

We examined whether interethnic bullying is more likely to be influenced by bullies' perceptions of victims' ethnicity or by victims' self-declared ethnic identification. Results show that self-declared ethnicity of students does not have a significant effect on bullying in any of our models controlling for gender, socio-economic status, and structural characteristics of the networks. Peer perception of ethnicity, however, has a significant effect on bullying both from the perspectives of bullies and victims, even after controlling for self-declared ethnicity of pupils (0.418, $p<0.05$, Model B, Table 26; 0.514, $p<0.05$, Model C, Table 26; 0.720, $p<0.001$, Model B, Table 27; 0.751, $p<0.01$, Model C, Table 27).

Examining the control variables, socio-economic status does not have a significant effect on bullying in our models. Gender, however, plays a significant role in bullying nominations. From the perspective of both the bullies and victims, the odds of a tie from a boy towards a girl is significantly lower, than that of between two girls. It is also less likely that girls report to bully boys than they report to bully other girls. In Model A based on bullies nominations, ties between boys occur significantly more likely than ties between girls (see Table 30 for details).

Table 30. The effect of gender on bullying

		Receiver's gender			
		Based on bullies' nomination		Based on victims' nominations	
	Sender's gender	girl	boy	girl	boy
Model A	girl	1.000	0.644***	1.000	0.583
	boy	0.437***	1.458*	0.566***	1.960
Model B	girl	1.000	0.662**	1.000	0.571
	boy	0.448***	1.525	0.557***	1.852
Model C	girl	1.000	0.658***	1.000	0.602
	boy	0.445***	1.474	0.569***	1.994

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

5.5. DISCUSSION

In this study, we examined whether bullying occurs more likely between students of different ethnic background than between same-ethnic students. We highlighted the difference between different types of measurements of ethnicity and examined whether self-declared ethnicity or perceptions about others' ethnic belonging matters more when bullies select their victims. We analysed dyadic peer nominations applying exponential random graph models to control for the structural characteristics of the networks. We also controlled for gender and socio-economic status of students. Bullying relations were analysed from the perspectives of both the bullies and victims to get a more accurate view about bullying in classrooms.

We found that while self-declared ethnicity of the students does not have a significant effect on the likelihood of bullying, perceptions about the classmates' ethnicity show a relationship with bullying relations. Our results suggest that students perceived as Roma are significantly more likely to be nominated both as victims and bullies than students perceived as non-Roma. More specifically, non-Roma students are more likely to report that they bully peers they perceive as Roma and that they are bullied by peers they perceive as Roma, than to bully peers and being bullied by peers they perceive as non-Roma. Roma students are also more likely to report that they are bullied by classmates they perceive as Roma, than by classmates they perceive as non-Roma. From the perspective of the bullies, however, Roma–non-Roma nominations are not significantly more likely, than Roma–Roma nominations. However, it is important to emphasize that while it is more likely that non-Roma students report to bully and being bullied by students they perceive as Roma than by classmates they perceive as non-Roma, self-declared Roma students do not report to bully and being harassed by non-Roma peers more likely, than non-Roma students do.

We have also found that Roma students are likely to report that they bully peers they perceive as Roma, but who do not identify themselves as Roma. This findings is in line with Boda and Néray's (2015) results who found that Roma students tended to exclude those classmates whom they perceived as Roma, but who, at the same time, identified themselves with the Hungarian group. These findings suggest that not only interethnic

relations are relevant to study but minority students' relations towards peers with inconsistent ethnic classification is also an important issue for future research.

The most important novelty of our study is that we included peer perception of ethnicity in our models. We argued that ethnicity is a social construct; therefore, there can be differences in the ways people classify themselves and are classified by others in different social contexts and over time. We claimed that perception of others' ethnicity is an important factor explaining social relations. Our findings suggest that future studies should indeed focus more on ethnic perceptions when examining positive or negative social ties.

Another interesting finding of our research is that students were more likely to report that they bully others, than to report being bullied by others. Previous studies comparing self-reports on bullying and victimization mostly found the opposite tendency: students were more likely to report being victimized (Faris and Felmlee, 2014; Salmivalli et al., 1996; Tolsma et al., 2013; Veenstra et al., 2007). Eslea and colleagues (2003) analysed bullying data from nine studies conducted in seven countries and found only two samples where students indicated bullying others more frequently than being victimized (in Japan and Spain). A possible reason for this difference can be the different formulation of the questions measuring the prevalence of bullying and victimization. Students' tendency to report more victimization, however, seems to be consistent across studies using different definitions of bullying. Another possible explanation might be that there are cultural differences in the inclination of admitting bullying behaviour. To test this assumptions further research is needed in Hungarian schools. In line with our findings, however, another study conducted in 186 Hungarian primary and secondary school classes also showed that students were more likely to report being aggressive towards other students than to report being victims of others' aggressive behaviour (Hajdú and Sáska, 2009).

Finally, some limitations of our study need to be considered. First, we analysed data from Roma and non-Roma Hungarian secondary school students. The situation of Roma minority differs in several aspects from the situation of other minorities and immigrant groups in Hungary or in other countries. In Hungary, the Act on the Rights of National and Ethnic Minorities identifies 13 minority groups that have been living for at least a

century on the territory of Hungary (Act LXXVII, 1993). Contrary to immigrants, the members of these minorities were born in Hungary, are Hungarian citizens and most of them speak Hungarian as mother tongue (Hungarian Central Statistical Office, 2011). The ethnic self-identification and perception of these people may be considerable different from that of people born outside of the country or living in an immigrant family. Moreover, surveys indicate that from all minority groups, including historical minorities as well as immigrants, Roma have to face the strongest discrimination and prejudice (Bernát et al., 2012; Csákó, 2011; Ligeti, 2006; TÁRKI, 2011a, 2011b). Thus, ethnicity may be more salient in social interactions if Roma people are involved, compared with members of other minorities. For these reasons, our findings may not be generalizable to other minorities inside and outside of Hungary. However, we think that the inclusion of peer perception of ethnicity would yield interesting results in other social settings as well.

Second, we measured bullying and victimization with four different items in our questionnaire. We formulated questions about physical aggression, mocking, gossip, and humiliation. Then, we combined these items into one bullying variable. There are several forms of bullying, however, that were not included in our questionnaire (e.g. social exclusion, cyberbullying). It would have also been possible to ask students whom they bully, leaving the interpretation of the word ‘bullying’ to students, or indicating some examples to help to answer the question. Further work is needed to check how robust our findings are, using different measures of bullying behaviour.

Third, the questionnaire did not contain any questions with regard to ethnic bullying. Students were not asked whether they are bullied by others explicitly because of their ethnic background (experiencing racist name calling, for instance). With questions on ethnic bullying we would be able to investigate whether ethnic conflicts and tensions are explicitly expressed in classrooms. We think, however, that by examining bullying in general among students, we were able to unravel mechanisms underlying interethnic relations that might not be explicitly expressed in the community.

Besides, not only self-declared ethnicity and dyadic peer perceptions of ethnicity could be included in the analysis, but aggregate measures of classmates’ opinions and classification by teachers could also have an effect on the structure of bullying. The

analysis of the effect of these two ethnicity measures on bullying and victimization, however, was beyond the scope of our study.

We analysed bullying and victimization of secondary school students. Previous studies suggest that bullying behaviour is more frequent among younger children and in early adolescence than during secondary school years (Espelage and Swearer, 2003; Kärnä et al., 2011; Nansel et al., 2001). Compared to adolescents, younger children are at a different stage in the development of ethnic identity and ethnic prejudice. Thus, ethnicity may have a different effect on interethnic bullying in these age groups, than among adolescents. Further research need to be done to analyse the associations between ethnicity and school harassment among children of younger age groups.

In future studies, this research could be extended with a multivariate analysis of friendship and bullying networks. Previous studies suggest that positive and negative networks are interrelated with each other. Students nominated as bullies by the same victims as well as students victimized by the same bullies tend to like each other (Huitsing et al., 2012). Furthermore, victims with the same bullies and bullies with the same victims tend to defend each other over time (Huitsing et al., 2014). The relationship between bullying and friendship networks might be affected by the ethnic belonging of the students.

Another possibility for future work is to analyse our research question using longitudinal social network data. Unfortunately, the number of Roma students in our sample dropped significantly after the first year of our research. Therefore, we were not able to draw conclusions about the dynamics of bullying networks during a longer time interval.

Despite these limitations, we were able to show that bullying nominations constitute social networks with several social mechanisms forming the structure of bullying. Moreover, our data provided a unique opportunity to analyse the effect of peer perceptions of classmates' ethnicity on bullying behaviour in secondary schools.

6. SUMMARY AND CONCLUSION

6.1. SUMMARY OF THE EMPIRICAL FINDINGS

This dissertation focused on the positive and negative relations among Roma minority and non-Roma majority secondary school students in Hungary. We aimed to extend our prior knowledge on interethnic friendships by examining the quality of friendships between Roma and non-Roma students compared to intra-ethnic ones. We also investigated interethnic bullying, a behavioural aspect of negative interethnic relations. Moreover, we identified the determinant factors of ethnic classification, and used both ethnic self-identification and peers' perceptions of classmates' ethnicity in our empirical analyses. We used the first two waves of a panel study conducted by the Research Center for Educational and Network Studies (RECENS) between the autumn of 2010 and spring of 2013 among Roma and non-Roma secondary school students.

In *Chapter 3* we examined which factors influence the ethnic classification of minority students. Specifically, we tested whether socio-economic status, social networks, and peers' and teachers' perceptions of academic abilities and achievement are associated with being classified as Roma. We assumed that students living under better socio-economic conditions are less likely to be perceived as Roma by peers than students living under worse socio-economic circumstances. We expected that pupils having more Roma friends are more likely to be classified as Roma than pupils having fewer Roma friends. We also hypothesized that students who are perceived by peers and teachers as having better academic abilities and achievement are less likely to be classified as Roma by their classmates than students perceived as having lower academic abilities and achievement. Consistent with our hypotheses we found that even after controlling for students' ethnic self-identification, socially disadvantaged students and students having more Roma friends are more likely to be classified as Roma by their peers both in cross-sectional and in longitudinal analyses. The more a student is perceived as smart and clever by classmates and teachers, the less likely that he or she will be classified as Roma by their peers over time. The regression analyses suggest, however, that other effects of peers' and teacher's perceptions of academic abilities and achievement on Roma classification are not unambiguously negative.

In *Chapter 4*, we examined whether there are similarities between the characteristics of inter- and intra-ethnic positive relations. Especially, we focused on the question whether intra- and interethnic friendship nominations differ from each other with regard to mutuality, trust, helpfulness, and shared activities. Based on previous studies we expected that interethnic friendship nominations are less frequently reciprocated, and characterized by co-occurring trust and jointly spent spare time nominations than intra-ethnic ones. We also hypothesized that nominated interethnic friends are less frequently perceived helpful than intra-ethnic ones. In a subsample of 13 classes, we first summed the number of inter- and intra-ethnic friendship ties and calculated the proportion of reciprocated nominations. Then, we calculated the proportion of outgoing friendship ties co-occurring with an outgoing trust, perceived helpfulness, and jointly spent spare time nomination. In line with our expectations we found that interethnic friendship nominations are indeed less often characterized by co-occurring trust, perceived helpfulness, and jointly spent spare time nominations than intra-ethnic ones. Both the inclusion of self-declared ethnicity and peer perceptions of ethnicity in the analysis suggest similar results. Analysing self-declared ethnicity we also found that interethnic friendship nominations are less frequently mutual than intra-ethnic ones. In the case of ethnic peer perceptions, however, outgoing nominations of non-Roma students are more often reciprocated by classmates perceived as Roma than by classmates perceived as non-Roma.

In *Chapter 5*, we investigated whether bullying is more likely between same-ethnic students or between students of different ethnic background. We expected that bullying occurs more likely between than within ethnic groups, and that minority students are more likely to be bullied by majority peers than the other way around. Bullying and victimization was measured from the perspectives of both the bullies and the victims, using dyadic peer nomination data. We used exponential random graph models, which enabled us to describe the structure of bullying nominations in the classrooms. Results of the meta-analysis of 12 classes showed that after controlling for gender, socio-economic status, and structural characteristics of the bullying networks, self-declared ethnicity of the students does not have a significant effect on the likelihood of bullying and victimization. If peer classification is being considered, however, students classified as Roma by their peers are more likely to be nominated as both bullies and victims, than students perceived as non-Roma.

6.2. MAIN SCIENTIFIC CONTRIBUTIONS OF THE STUDY

Our study extends previous research in several major ways. A key strength of the study is that we measured both ethnic self-identification of students, and peers' perceptions of their classmates' ethnicity. Previous studies also concentrated on ethnic classification reported by the interviewers (Saperstein and Penner, 2012; Telles and Lim, 1998), or selected the minority group sample based on the ethnic perceptions of members of the social environment of the respondents (Kemény and Janky, 2006). To our knowledge, however, the *'Wired into Each Other'* is the first study in which dyadic ethnic perceptions were measured, asking every student's opinion about the ethnic belonging of every classmate, at different points in time. This way of measurement not only allowed us to examine ethnic classification processes, but also to use data on ethnic perceptions in social network analysis.

Although several studies showed that ethnic identification is associated with the social ties of individuals (Agirdag et al., 2011; Leszczensky, 2013; Lubbers et al., 2007; McFarland and Pals, 2005; Munniksma et al., 2015; Sabatier, 2008), fewer studies concentrated on the question whether individuals' friendship relations influence the way they are ethnically classified by others (see Boda, 2015 for an example). This thesis extends our knowledge of ethnic classification processes by showing that students are more likely to be classified as members of the minority group if they choose minority friends. Moreover, the empirical findings provide a new understanding of the relationship between ethnic perceptions and perceptions of academic achievement. Our results suggest that students' perceptions of their peers' academic abilities and achievement might affect the way they perceive these peers' ethnicity.

We had the possibility to analyse a wide variety of social network items to examine interethnic relations among Roma and non-Roma Hungarian students. To extend previous knowledge on attitudes and relations among the Roma and non-Roma, we studied friendship networks, trust relations, shared activities, and negative relations of secondary school students. International studies on the quality of interethnic friendships are rare, but even less is known about the characteristics of friendship relations among Roma and non-Roma adolescents. We confirmed previous findings that friendship relations are ethnically segregated, and contributed additional evidence that suggests

that interethnic friendships are less frequently reported to be characterized by trust, helpfulness, or joint activities than intra-ethnic ones.

The study has gone some way towards enhancing our understanding of interethnic bullying. International knowledge on interethnic bullying is scarce. Only few studies used statistical models that are appropriate for analysing dyadic peer nominations to investigate whether bullying occurs more often between or within ethnic groups (Hooijma, 2015; Tolsma et al., 2013). To our knowledge, this is the first study, which analysed data on complete social networks, and controlled for endogenous network processes applying exponential random graph models to investigate interethnic bullying among Roma and non-Roma Hungarian students. Standard statistical models cannot model network dependencies; therefore, they would have provided biased estimates for the effect of ethnicity.

Furthermore, the findings of this study add to a growing body of literature on the empirical analysis of the effects of different classification systems (Boda and N  ray, 2015; Penner and Saperstein, 2015; Telles and Lim, 1998). Since we not only included the ethnic self-identification of students in the analysis, but also examined ethnic perceptions of classmates, we showed that including different ways of classification provides different estimates for the effect of ethnicity in empirical analyses. If we had concentrated on self-declared ethnicity only, important mechanisms underlying positive and negative interethnic relations would have remained hidden.

6.3. THEORETICAL IMPLICATIONS

After a long tradition of research on positive interethnic relations among students, scientific focus has recently turned towards negative relations between students of different ethnic background (Boda and N  ray, 2015; Jackson et al., 2006; Rambaran et al., 2015; Rodkin et al., 2007; Stark et al., 2013). Especially in bullying research, the role of ethnicity has received considerable attention (Fandrem et al., 2009; Hanish and Guerra, 2000; McKenney et al., 2006; Tolsma et al., 2013; Verkuyten and Thijs, 2002; Vervoort et al., 2010). Negative interethnic relations are important to study because they may undermine the positive effects of school desegregation on social integration. If negative interethnic relations are more prevalent than positive ones, intergroup contact

can lead to negative experiences with members of the outgroup and thus increase prejudice (Pettigrew, 2008; Stark et al., 2013). Our research, similarly to Boda and Néray's (2015) study, indeed showed that not only positive networks are ethnically segregated, but negative relations also occur between ethnic groups. Studies focusing on interethnic relations should thus not only examine positive relations but take also into account the negative relations between ethnic groups.

In this dissertation we aimed to contribute to the understanding of how ethnicity is constructed. Furthermore, we explicitly addressed the question how different ways of ethnic classification affects quantitative empirical research findings. In line with previous studies (Eschbach and Gómez, 1998; Harris and Sim, 2002; Hitlin et al., 2006; Ladányi and Szelényi, 2006; Saperstein and Penner, 2012; Simonovits and Kézdi, 2014; Telles and Paschel, 2014), we found that both ethnic self-identification of students and peers' perceptions of classmates' ethnicity changed from one wave of the research to the other.

We also showed that the inclusion of peer perceptions in the analysis reveals mechanisms that would remain hidden if only self-declared ethnic identification were analysed. Self-declared ethnicity, for instance, had no statistically significant effect on bullying in our sample. Classmates who were perceived as Roma by the sender of the tie, however, were more likely to be nominated as both bullies and victims than students perceived as non-Roma. Boda and Néray (2015) found in friendship networks that Roma students preferred only those Roma peers whom they perceived as Roma and who themselves declared being Roma as well. Non-Roma students tended to dislike those classmates whom they perceived as Roma. Furthermore, Penner and Saperstein (2015) showed that racial disparities in young adults' arrest rates in the US are more closely associated with how they are racially perceived by others than with their racial self-identification. Future empirical studies should thus take into account that neither ethnic classification nor ethnic identity is fixed across different situations and over time, and consider that using different classification systems different conclusions might be drawn from the analysis.

6.4. IMPLICATIONS FOR SOCIAL POLICY

Schools provide an important opportunity for interethnic relations. School practice influences both the opportunities for contact (Blau, 1977b; Coleman, 1961; Feld, 1981; Feld and Carter, 1998; Hallinan and Williams, 1989; Moody, 2001; Newcomb, 1961) and the social significance of interaction (Allport, 1954; Moody, 2001; Schofield, 1991, 1979). Schools are thus able to foster the formation of interethnic friendships. Extracurricular activities, for instance, provide opportunities for cooperative interaction between students and can promote the formation of positive interethnic relations (Crain, 1981; Holland and Andre, 1987; Moody, 2001; Slavin and Madden, 1979). In our sample, however, students indicated very few classmates with whom they share extracurricular activities. One reason for this might be that the majority of students do not participate in these activities. Another reason might be that although pupils do different kinds of such activities, those are not organized by schools. In order to improve interethnic relations, schools can increase the number of extracurricular activities and motivate students of different ethnic background to jointly participate in them.

The common ingroup identity model suggests that students of different ethnic background can be united under a common group identity by creating and strengthening a more inclusive group category (Gaertner et al., 1989). If students share a common interest in a sport or music activity, for instance, their common group identity can be defined based on this activity. Stark and Flache (2012) warn, however, that interventions aiming to create a common ingroup can fail if students' opinions and interests correlate with ethnicity. Successful interventions thus require a thorough investigation of students' interests and attitudes.

Our research revealed that students in Hungary are more likely to report that they bully others, than to report being bullied by others. Previous studies from other countries mostly found the opposite tendency (Faris and Felmlee, 2014; Salmivalli et al., 1996; Tolsma et al., 2013; Veenstra et al., 2007). A possible explanation might be that there are cultural differences in the inclination of admitting bullying behaviour. To test this assumption further research is needed, but this finding suggests that not only the attitude toward bullying but bullying behaviour and the effective strategies against bullying

might also be different across countries. Several successful anti-bullying programs have been implemented in other countries (e.g. Olweus Program, KiVa), but careful examination is needed before their implementation in Hungary.

6.5. LIMITATIONS

Our study has some limitations. First, due to the lack of knowledge on grades or test scores, we were not able to study academic achievement of students. The opportunity for interethnic contact is only one aspect of educational integration. Integration might also affect students' school performance. Whereas it seems to be widely accepted among scholars that educational integration is beneficial for social integration (Allport, 1954; Coleman et al., 1966; Kertesi and Kézdi, 2009a; Pettigrew, 1998, 1998; Stark et al., 2013), there has been great scientific and societal debate whether school integration is advantageous for both majority and minority children in terms of academic achievement. Whereas several studies found no negative effect of integrated school settings on majority students' school performance (e.g. Angrist and Lang, 2004; Kézdi and Surányi, 2008), a meta-analysis of international studies showed a very weak but negative effect of ethnic diversity on school achievement (Driessen, 2007; cited by Stark, 2011). Moreover, Fryer and Torelli (2010) found in the US that whereas acting white taunts towards black students are not present in segregated schools, they are prevalent in integrated schools where high achieving black students are more likely to be sanctioned by their black peers. Further studies are needed to investigate under which circumstances has educational integration in Hungary a positive effect on both majority and minority students' school performance and under which conditions can interethnic relations in schools positively affect academic achievement.

Second, our data have not allowed us to examine the effect of students' neighbourhood, neither on interethnic friendships, nor on ethnic classification. Similarly to schools, neighborhoods provide opportunity for interethnic contact and thus can shape preferences for interethnic friendships. Contact theory (Allport, 1954; Pettigrew, 1998; Pettigrew and Tropp, 2006) and ethnic competition theory (Blalock, 1967) provide different predictions whether interethnic contact increases or reduces prejudicial attitudes. Whereas contact theory suggests that positive contact decreases prejudice, ethnic competition theory predicts that larger proportion of the outgroup increases

hostility. Not only the proportion of ingroup and outgroup members in schools, but those in individuals' neighbourhood might affect their outgroup attitudes and preferences for interethnic friendships (Kruse et al., 2016; Vermeij et al., 2009). Empirical findings with regard to the association between ethnic diversity of neighbourhoods and outgroup attitudes, trust, and community cohesion are mixed (Putnam, 2007; Semyonov and Glikman, 2009; Sturgis et al., 2011).

Ethnic diversity of neighbourhoods, however, not only affects interethnic friendships through outgroup attitudes but through meeting opportunities as well. Mouw and Entwisle (2006) and Kruse et al. (2016) found that adolescents are likely to befriend peers who live nearby them or who are friends of a friend living nearby them. Residential segregation, however, plays only a minor role in interethnic friendship formation within schools. Whether residential segregation in Hungary explains friendship segregation among Roma and non-Roma students, however, remains an open question.

Residential segregation might also influence how individuals are classified by others. Living in a Roma neighbourhood, for instance, increases the possibility of being categorized as Roma (Csepeli and Simon, 2004; Ladányi and Szelényi, 2006). In Brazil (2002), Telles found that browns are more likely to be classified as white if they live in areas with higher proportions of whites. Although we asked students whether they live in a neighbourhood with mostly other Roma families, this subjective residential segregation measure was not associated with ethnic classification of students. A more precise measure of residential segregation might show an influence on ethnic classification.

Another limitation is that we only collected class-level nominations of students. Therefore, we do not have data on friendships crossing class boundaries within the schools or on friendships outside school. Leszczensky and Pink (2015) and Valente et al (2013) argued that variations in network boundaries might affect the degree of ethnic segregation in friendships. Both studies showed that ethnic homophily is more pronounced for grade-level friendships than for within-class friendships. Leszczensky and Pink (2015) argued from a rational choice perspective that befriending school peers outside the classroom requires more time and effort than forming friendships within one's own class. We argue, that the criteria emphasized by Allport (1954) are more

likely to be met within classrooms than within schools. Students have to cooperate for shared goals with classmates more frequently than with peers from other classes. Both explanations suggest that within-class friendship nominations will be more likely to occur than grade- or school-level friendship nominations. Therefore, ethnic segregation might have been more pronounced in our analyses if we were able to include class-level nominations in our models.

Studies on bullying also found that aggressive behaviour towards peers is not only observable within classrooms but it frequently occurs among students of different grades. Huitsing et al (2014) showed that although the majority of bullying happened within grades, higher-grade students also tended to bully students from lower grades. If ethnic homophily is more pronounced in grade-level friendship networks and if friendship and bullying networks are interrelated with each other (Huitsing et al., 2012), ethnicity might play a larger role in school-level bullying than in within-class bullying.

Our results cannot be generalised to Hungarian secondary schools. Our sample comprised seven schools from four settlements, most of them located in the Eastern part of Hungary. The sampling procedure followed the tradition of other network studies. Instead of having a large representative sample of the Hungarian secondary schools, we aimed to collect data on every student of the selected classes in order to get information on complete networks of the classrooms. Due to the main research question of the study, schools with a high proportion of Roma students were overrepresented in the sample. Furthermore, more girls than boys participated in the research.

The student population in the selected schools does not represent the Roma student population in Hungary. Large regional differences exist in the history, cultural characteristics, assimilation processes, and socio-economic status of the different Roma group. In the North-Eastern region, the majority of the Roma belong to the Romungro Roma group, speak Hungarian as mother tongue, and have dual Roma and Hungarian ethnic identification. In the South-Western area, in contrast, a higher proportion of the Roma population belongs to the Boyash Roma group and speak a Roma language as mother tongue (Havas, 1999; Kemény et al., 2004). Similarly to the Roma living in the North-Eastren region, the vast majority of the Roma students in the sample reported to belong to the Romungro group and to speak only Hungarian with family members and

friends. Interethnic relations and classification processes might therefore show different patterns in other areas in Hungary than in the sample of the study. Our findings, however, provide some important insights about interethnic relations among Roma and non-Roma students and can be a starting point for further research.

6.6. DIRECTIONS FOR FUTURE RESEARCH

Several directions for future research have already been mentioned previously, but our study has revealed some other open questions as well. In Chapter 3 we examined the determinant factors of ethnic classification. We found that students having more Roma friends are more likely to be classified as Roma by their peers than students having fewer Roma friends. This association suggests that social networks of individuals do not only affect how they identify themselves (McFarland and Pals, 2005; Munniksmä et al., 2015), but also how others categorize them. The more Roma friend an individual select, the more likely that others consider him or her to be a member of the Roma group.

We included the first-wave values of the independent variable in the regression model to shed some light on the causal relations between our variables, but reverse causality cannot be ruled out. It is probable that the relationship between ethnic classification and social networks of students is bidirectional: not only are students with Roma friends classified as Roma, but students classified as Roma by others might also select Roma friends. The reason for this might be that if non-Roma classmates classify someone as an outgroup member, and exclude him or her from their social circles, then the available peers the individual can befriend are Roma. Ethnic identity might play a mediating role in this process. Students classified as Roma by others might start to consider themselves as Roma, and thus Roma peers become ingroup members.

Studies on identification showed that the causal link between social networks and identification goes into both direction. Whereas social networks influence identification (McFarland and Pals, 2005; Munniksmä et al., 2015), identification also affects whom people befriend (Leszczensky et al., 2016; Munniksmä et al., 2015; Rutland et al., 2012). Similarly, there might be a bidirectional causal link between classification and social networks. Moreover, it is highly probable that classification and identification influence each other, as inconsistencies in identity causes stress for individuals (Burke,

1991). Although our study only focused on the determinant factors of ethnic classification, recent methodological development in social network analysis (e. g. stochastic actor-oriented models, see Snijders et al., 2010; Steglich et al., 2010) enable researchers to disentangle the effects between identification, classification, and social networks in future studies.

As we already emphasized, we were not able to include academic achievement in the analysis. Researchers usually find a homophily effect with regard to school performance among students, indicating that classmates having similar grades tend to befriend each other (Flashman, 2012, 2011). Two different mechanisms can cause this similarity: students might select friends with similar school performance, and friends' academic achievement might exert an influence on students' achievement (Flashman, 2011). It has also been shown, however, that having high-achieving friends can positively affect one's performance (Altermatt and Pomerantz, 2005; Flashman, 2014). Further studies should investigate whether, how, and under which circumstances friends' academic achievement influences students' performance in a Hungarian context, and how this association is moderated by the inter- or intra-ethnic nature of friendship. The study of these questions would add some insights about how educational integration could promote both academic achievement of students, and interethnic relations among them.

7. REFERENCES

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8. APPENDICES

8.1. APPENDIX 1: STUDENT QUESTIONNAIRE

OTKA T/81336

QUESTIONNAIRE

November 2010.

Corvinus University of Budapest

Department of Sociology and Social Policy

Research Center for Educational and Network Studies

Before you start, please read it!

By filling out this questionnaire you provide help in a research project carried out by the Research Center for Educational and Network Studies affiliated with the Corvinus University of Budapest. The research is funded by the Hungarian Scientific Research Fund. You can read more here: <http://www.recensproject.hu/eng/>

The questionnaire is anonym – it does not contain your name or any information with which you could be identified. All results would be presented in a way that no students, no classes and no schools may be identified.

Your cooperation is your free will – if you wish not to answer any of the questions please, leave it blank!

The questionnaire is not a test – **there are no good or bad answers**. If you do not find any provided answers a perfect fit, please try to find the best compromise you can.

Sometimes we ask you answer **with your own words**, we sign this with: “*es*”. Other times we ask you to **circle** the best answer, which we sign with: “O”. In order to this research be successful, please **answer honestly and judiciously**, and please fill the questions **in the order they appear**. Do not forget that we treat your answers confidentially!

We wish you enjoy the questionnaire! Should you have any problem, please turn to the administrator in the room! We are grateful for you help!

1. ✍ Please, give your personal code.

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2. ✍ Date of birth: Year: 19..... Month (e.g. if you were born in May, write 05) ✍ :.....

3. ☐ Sex?

1. Male.
2. Female.

4. ✍ Where (in which settlement) do you live? ✍

The following questions will concern your family. If you were not brought up mostly by your ... parents, but by foster parents or anyone else, your answers should refer to them. In case you have a father and a foster father as well, think of the one who was more involved in your upbringing.

5. ☐ How do you rate your school performance in the last academic year of the primary school?

1. I was among the best.
2. I belonged to the well-performing students.
3. I was an average student.
4. I belonged to the poorly-performing students.
5. I was one of the worst students.

6. ☐ Have you repeted any class in elementary school? If yes, how many times?

1. Yes, ✍ times.
2. No.

7. ☐ For some students good grades are important, for others no so much. Which statement fits best to you among the following?

1. I am only satisfied with myself if I get good grades.
2. I do not like to get good grades.
3. My grades do not influence if I am satisfied or not.

8. ☐ In each class students think differently about “good” and “bad” students. Which statement applies to your class among the following?

1. My classmates accept someone who has good gredes.
2. My classmates accept someone who has bad gredes.
3. My classmates acceptance of someone does not depend on grades.

9. ○ Are you used to...

- | | | | |
|---|--------------------|--------------------|--------------|
| 1. ...help someone do his or her homework? | 1. yes, frequently | 2. yes, but rarely | 3. no, never |
| 2. ...copy someone's homework? | 1. yes, frequently | 2. yes, but rarely | 3. no, never |
| 3. ...let someone to copy your homework? | 1. yes, frequently | 2. yes, but rarely | 3. no, never |
| 4. ...tell the teacher if someone is cheating (e.g. when writing a test)? | 1. yes, frequently | 2. yes, but rarely | 3. no, never |
| 5. ...confront a teacher? | 1. yes, frequently | 2. yes, but rarely | 3. no, never |
| 6. ...cheat when you write a test? | 1. yes, frequently | 2. yes, but rarely | 3. no, never |
| 7. ...help someone when he or she answers the teacher for a grade? | 1. yes, frequently | 2. yes, but rarely | 3. no, never |

10. ✎ How much do you study for a bigger test in the following subjects? Please answer in hours.

- | | |
|----------------------|---------------|
| 1. Mathematics: | ✎ hours |
| 2. Literature: | ✎ hours |
| 3. Grammar: | ✎ hours |
| 4. History: | ✎ hours |
| 5. Foreign Language: | ✎ hours |

11. ✎ With what grade would you be satisfied for the following subjects?

- | | |
|----------------------|---------|
| 1. Mathematics | ✎ |
| 2. Literature. | ✎ |
| 3. Grammar. | ✎ |
| 4. History. | ✎ |
| 5. Foreign Language. | ✎ |

12. ○ Are your parent satisfied with your grades?

1. Yes.
2. No.
3. Partially.
4. I don't know.

13. ○ What are your plans after high-school?

1. Although I am not studying in a program which ends with graduation, I would like to graduate anyway.
2. I would like to have an additional certificate in some vocation.
3. I would like to pursue a degree in higher education.
4. I would like to work.
5. I don't know yet.
6. I don't even want to finish high-school.

In the following question we would like to get to know a few things about your classmates.

14. ✎ In the first coulumn you can read statements, the remainig column headers contain the name of your classmates. Please, put an “x” in the cells of which the content you feel right. E.g. if the second colum contains the name of a classmate with whome you go home together, put an “x” in the fourth row, second column.

I am not sure who he /she is,								
I knew him/her when the class was formed.								
I usually sit next to him/her during class.								
We usually go home together.								
We have private classes or do sports together.								
We spend our sparetime together .								
We study together.								
I’m dating him/her.								
I dated him/her.								

15. ○ Please tell us how much you like or dislike your classmates. “-2” stands for strong dislike or hate, “-1” for dislike, “0” for neutrality, “1” for like and “2” for close friendship. Please mark one number in every line!

	-2: hate	-1: dislike	0: neutral	1: like	2: good friend
	-2	-1	0	1	2
	-2	-1	0	1	2
	-2	-1	0	1	2
	-2	-1	0	1	2

The following questions refer to you.

16. ○ What do you think how mature are you compared to your classmates? Compare yourself to same-gender classmates!

1. I look much younger than others.
2. I look somewhat younger than others.
3. I look about the same than everybody else.
4. I look somewhat more mature than others.
5. I look much more mature than others.

17. ○ Some students have already tried tobacco. Do you smoke?

- | | |
|----------------------------------|------------------------------|
| 1. No, never. | 3. Yes, but only in company. |
| 2. No, but I have already tried. | 4. Yes, regularly. |

18. ○ Some students have already tried alcohol. Do you drink?

- | | |
|----------------------------------|--------------------------------|
| 1. No, never. | 3. Yes, but only occasionally. |
| 2. No, but I have already tried. | 4. Yes, at least once a week. |

19. ○ Some people consider themselves Hungarian, others belong to other ethnic groups. What group do you consider yourself to belong to?

1. Hungarian. **⇒ Please continue with question 22.**
2. Roma/Gipsy.
3. Roma/Gipsy and Hungarian at the same time.
4. Other: ✍ **⇒ Please continue with question 22.**

20. ○ If you consider yourself Roma/Gipsy (as well), please determine to which Roma/Gipsy group do you belong?

1. Lovári.
2. Beás.
3. Romungro.
4. Other Roma/Gipsy group: ✍

21. ○ Do you speak a language with your family and friends other than Hungarian?

1. Yes, Lovári.
2. Yes, Beás.
3. Yes, other: ✍
4. No, I only speak Hungarian with my family and friends.

22. ○ How would you describe the neighborhood you live in?

1. Only Roma/Gipsy families are living in the neighborhood.
2. Mostly Roma/Gipsy families are living in the neighborhood.
3. Both Roma/Gipsy and Hungarian families are living in the neighborhood.
4. Mostly Hungarian families are living in the neighborhood.
5. Only Hungarian families are living in the neighborhood.

The following questions refer to your classmates.

23. ✎ In the first column you can read statements, the remaining column headers contain the name of your classmates. Please, put an "x" in the cells of which the content you feel right. E.g. if you think that your classmate in the first column has a good sense of humor, put an "x" in the first row in the first column.

Has a good sense of humor.					
Quarrelsome, he/she is into fights.					
Pointdexter.					
Gossipy.					
Charitable.					
Clever, smart.					
Has good grades.					
He/she is into parties.					
Teacher's pet.					
Stuck-up.					
Reserved.					
Roma/Gipsy.					

24. ✎ In the first column you can read statements, the remaining column headers contain the name of your classmates. Please, put an "x" in the cells of which the content you feel right. E.g. if you classmate in the first column is one to whom you look up, put an "x" in the first row in the first column.

I look up to him/her.					
I look disdain him/her.					
She is a pretty girl/He is a handsome boy.					
I would like to go out with him/her.					
He/she dares to confront the headmaster.					
He/she has money.					
He/she tells what to do after classes.					
He/she protects the weak.					
If I had a secret, I would tell it him/her.					
He/she is able to make justice.					
He/she would be a good organizer for the class trip.					
If I needed help, I could ask him/her.					
A lot of people look up to him/her, yet he/she doesn't deserve it.					

25. ✍ In most classes there are some classmates to whom others look up, who have a good reputation. Some others are disdained, jibbed, ignored. Please think about your classmates' opinion of every students in your class, and put exactly one "x" in every column! The more people look up to somebody the higher you put the "x", the more ignored is someone, the downer you put the "x".

A lot of people look up to him/her.				
He/she is neutral to others.				
A lot of people disdain him/her.				

26. ✍ What do you think, what are the characteristics necessary to have a good reputation, to be looked up to?

.....

27. ✍ What do you think, what are the characteristics necessary to have a bad reputation, to be disdained?

.....

The next questions are related to your romantic relationships.

28. ☐ Are you seeing someone?

1. Yes.
2. No.

29. ☐ Did you have a girlfriend or a boyfriend ever?

1. Yes.
2. No. \Rightarrow Please continue with question 32.

30. ✍ How many romantic relationships have you had? ✍

31. ✍ Think about your most recent romantic relationships. If you are currently seeing someone, start with him/her!

What is him/her name (first and last name)?	How did you meet him/her?
	Please indicate those which apply from the list below!

- | | | |
|--------------------------------|---|---------------------------------|
| 1. We are classmates. | 5. From the neighborhood. | 9. We met through the internet. |
| 2. We go to the same school. | 6. We met through our parents or relatives. | 10. Other. |
| 3. We went to the same school. | 7. We met through our friends. | |
| 4. We were classmates. | 8. We met at a party or a bar. | |

32. ✎ Please try to decide if it is cool or lame to go out with someone to whom the following statements are true. Please put exactly one “x” in each row.

	Very lame	Lame	Does not matter	Cool	Very cool
Who has not see anyone before.					
Who is in the same class.					
Who has seen someone before.					
Who dated some of your friends.					
Who has a lot of friends in the class.					
Who doesn't have friends in the class.					
Who has good grades.					
Who is Roma/Gipsy.					
Who is disliked by a lot of students in his/her class.					
Whose parents are poor.					
Who you met through the internet.					

The following questions refer to your relationship with your classmates.

33. ✎ In the first column you can read statements, the remaining column headers contain the name of your classmates. Please, put an "x" in the cells of which the content you feel right.

Who did you beat up?				
Who did beat up you?				
Of whom do you say bad things to 'your friends'?				
Who says bad things about you?				
Who do you mock?				
Who mocks you?				
Who did you deliberately humiliate?				
Who humiliated you deliberately?				

34. ○ Please mark the statement with which you agree the most!

1. If one of your classmates acts in a way you do not like, you can hurt him or her.
2. If one of your classmates acts in a way you do not like, you must hurt him or her.
3. Even if one of your classmates acts in a way you do not like, you cannot hurt him or her.

The following questions refer to your family. If you were not brought up by your biological parents, please refer to the people who brought you up. If you have both biological and stepparents, please think about the one who was most influential.

35. ○ Please mark everyone from the list with whom you live in the same household.

1. Biological mother.
2. Biological father.
3. Stepmother.
4. Stepfather.
5. Sibling(s).
6. Grandparent(s).
7. Other relatives.
8. I live in state care.

36. ○ What is your mother's highest level of education?

1. less than 8 grade
2. 8 grade (elementary school)
3. vocational school
4. grammar school (with school leaving exam)
5. technical school (with school leaving exam)
6. college (BA)
7. university (MA or higher)
8. I don't know.
9. I don't have a mother or stepmother.

37. ○ What is your father's highest level of education?

1. less than 8 grade
2. 8 grade (elementary school)
3. vocational school
4. grammar school (with school leaving exam)
5. technical school (with school leaving exam)
6. college (BA)
7. university (MA or higher)
8. I don't know.
9. I don't have a father or stepfather.

38. ○ Which statement describes best your family?

1. We are way better off compared to my classmates.
2. We are somewhat better off compared to my classmates.
3. We live under similar circumstances compared to my classmates.
4. Our situation is somewhat worse compared to my classmates.
5. Our situation is somewhat way compared to my classmates.

39. ☐ Has your father been permanently (at least for three months) unemployed in the last academic year (since September 2009)?

1. Yes.
2. No.
3. I don't know.

40. ☐ Has your mother been permanently (at least for three months) unemployed in the last academic year (since September 2009)?

1. Yes.
2. No.
3. I don't know.

41. ✎ Please mark the objects that you or your family has at home! How many (if you or your family do not have an object, put "0")?

- | | |
|----------------------|-------------------|
| 1. Color TV: | ✎ <i>pc</i> |
| 2. Washing machine: | ✎ <i>pc</i> |
| 3. Yacht: | ✎ <i>pc</i> |
| 4. Computer: | ✎ <i>pc</i> |
| 5. Plasma TV: | ✎ <i>pc</i> |
| 6. Jacuzzi or sauna: | ✎ <i>pc</i> |
| 7. Dishwasher: | ✎ <i>pc</i> |
| 8. Car: | ✎ <i>pc</i> |
| 9. Mobile phone: | ✎ <i>pc</i> |





42. ☐ Please mark those objects which are in your personal use.

1. Desk.
2. Room.
3. A place where you can study without being disturbed.
4. A computer that you can use for school assignments.
5. Computer software (e.g. Excel, Word).
6. Access to the internet.
7. Personal computer (laptop or desktop).
8. Classic literature books.
9. Books that may help in your studies e.g. encyclopedia (besides mandatory books).

43. ○ How many books do you have at home? *On a one meter long bookshelf about 30 books can be stored. Please do not count newspapers and magazines!*

1. 0 – 10 books
2. 11 – 25 books
3. 26 – 100 books
4. 101 – 200 books
5. 201 – 500 books
6. More than 500 books.

44. ○ In your apartment how many....

- | | |
|-----------------------------|--|
| 1. ... rooms are there? |  pc |
| 2. ... kitchens are there? |  pc |
| 3. ... bathrooms are there? |  pc |
| 4. ... toilettes are there? |  pc |

45. ○ In some families there are many rules, in some others there are only a few or none. Please indicate all the issues from the following list for which your parents have rules and try to make sure you keep them.

1. You have to be at home by a pre-set time on Saturday evening.
2. Who to make friends with.
3. Who to date.
4. How much time should you spend with doing your homework, preparing for your classes.
5. To be at home at Sunday lunch and have it together with the family.
6. None of the above mentioned.

Thanks for your answers!

If you are curious about the project or the preliminary results, please visit this site:
<http://recensproject.hu/eng/>

8.2. APPENDIX 2: TEACHER QUESTIONNAIRE

Dear headmaster,

The Research Center for Educational and Network Studies affiliated with the Corvinus University of Budapest conducts a survey research in your class among other classes. The research is funded by the Hungarian Scientific Research Fund (T/81336). Please help our work by filling out this questionnaire. Participation is anonym and free. However, your help is crucial as you may observe details that nobody else can in your class. We appreciate your cooperation!

The following questions relate to you.

Beginning of survey: 2010. Month: Day: Hour: Minute:

1. ☐ Your year of birth: Year: 19.....

2. ☐ First year of working as a teacher: Year: 19.....

3. ☐ What is your level of qualification?

1. University degree, diploma.
2. Other higher education.
3. Other:

4. ☐ How would you describe the cooperation among faculty members in your school?

1. Faculty members work together smoothly and willingly at all times.
2. Faculty members work together smoothly and willingly most of the time.
3. Most of the time faculty members do not work together smoothly and willingly.
4. Faculty members never work together smoothly and willingly.

5. ☐ Were you able to restart your career, would you become a teacher again?

1. Absolutely.
2. Maybe.
3. Maybe not.
4. No, out of question.

6. ☐ If you were able to decide freely, you would teach...

1. ...in the same school.
2. ...in a different school.

From now on, we ask some questions about students in your class. In some cases we ask for your personal opinion, other cases we ask you to provide school-administered information about them.

7. ☐ In some schools the leading crowd or the "core" of the class may influence profoundly other students' life in school. Have you noticed such groupings in your class?

1. No such group exists in my class. \Rightarrow Please continue with question 11.
2. Yes, there is one core group.
3. Yes, there are two such groups.
4. Yes, there are more than two such groups.

8. ✍ Please list the head figures of these groups! Please use both first and family names!

First Group

Second Group

1.

1.

2.

2.

3.

3.

4.

4.

Third Group

Fourth Group

1.

1.

2.

2.

3.

3.

4.

4.

9. ✍ According to your opinion, what characteristics make someone to be looked up to?

10. ✍ According to your opinion, what characteristics make someone to be disdained by others?

11. ✍ Are there any students in your class who repeated classes?

1. No.
2. Yes, the following: ✍

.....

12. ☐ In some schools students are assigned to seats, in others they can choose where they sit during calsses. What is the situation in your class?

1. Yes, students are being assigned to their desk by their teachers.
2. There is no general rule, but some students are assigned to certain desks.
3. Students may sit wherever they want.
4. Other: ✍

13. ✎ In this table we ask you about each and every of your students. Please fill it out in the following way: put an “x” in all the columns containing the name of the students where you feel that the statements in the rows are true.

Clever, smart				
Hardworking				
Help others in academic progress				
Hamper others in academic progress				
Being looked up to				
Being disdained				
Aggressive				
His/her parents come to meetings regularly.				
Roma/Gipsy				
HH				
HHH				

14. ✎ In this table we ask you about each and every of your students. Please fill it out in the following way: put an “x” in all the columns containing the name of the students where you feel that the statements in the rows are true or use a number if applicable.

Skipped classes without permission						
He/she has been reprovod.						
He/she has been honored.						
He/she has a child.						
He/she is married, or lives in co-habitation with a significant other.						

9. LIST OF PUBLICATIONS

Peer-reviewed journal articles

Kisfalusi, Dorottya (2016): The Quality of Inter- and Intra-ethnic Friendships among Roma and Non-Roma Students in Hungary. *Corvinus Journal of Sociology and Social Policy*, forthcoming.

Others

Kisfalusi, Dorottya and Judit Pál (2015): *Capturing Status Positions: The Role of Peer Admiration and Peer Acceptance in Adolescents' Bullying Networks*. XXXV International Sunbelt Social Network Conference. Brighton, UK

Kisfalusi, Dorottya and Judit Pál (2014): *Perception of Your Ethnicity Makes You Be More Bullied? Peer Perception and Self-Declaration of Ethnicity in Bullying and Victimization Processes*. 1st European Conference on Social Networks, Barcelona, Spain

Kisfalusi Dorottya, Sára Horlai and Krisztina Andrási (2013): *Interethnic Relations, Ethnic Classification by Peers, and Identity Change: Is There a Connection?* XXXIII: Sunbelt Social Network Conference, Hamburg, Germany

Kisfalusi Dorottya, Sára Horlai and Krisztina Andrási (2013): *Interethnic Relations and Ethnic Classification by Peers: Is There a Connection?* 9th HUNNET Conference, Budapest, Hungary