The Potential of International Student Assessments to Measure Educational Outcomes of Roma Students

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The Potential of International Student Assessments to Measure Educational Outcomes of Roma Students. This article explores the potential of international student assessments to measure learning outcomes of Roma students, taking PISA 2009 as example. We find that even though many countries with considerable Roma minorities participated in PISA, Slovakia is the only country that has collected a sufficient large amount of data about Romani-speaking students. Drawing on household surveys, we discuss possible reasons for the underrepresentation of Roma students in international assessments. Furthermore, we disaggregate PISA 2009 data in order to compare learning outcomes between Romani-speaking students and their Slovak- and Hungarian-speaking peers. Results point to multiple disadvantages of Romani-speaking students with regard to pre-school participation, school entry, grade repetition and learning outcomes. Finally, we discuss options to improve the analysis of learning outcomes of Roma students.
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Introduction: Roma and education statistics

Roma are considered to be Europe's largest minority. The Council of Europe estimates that over 11 million Roma live in the Council of Europe area and close to six million in the European Union (Council of Europe 2010, online source). The highest share of Roma is estimated to live in Bulgaria, the Former Yugoslav Republic of Macedonia (FYROM), Slovakia, Romania, Serbia (excluding Kosovo) and Hungary (*ibid*).

Contrary to public perception, most Roma groups have been sedentary for centuries. Some Roma groups (especially in Great Britain and France) might still lead a lifestyle which includes traditional travelling. Others might have a first, second or third generation migration background, for example Roma who have migrated from Central and Southeast Europe to Western Europe because of armed conflicts or in search of work. Most Roma however cannot be considered as migrants. Many (but not all) Roma face difficult living conditions and belong to the poorest strata of society. Since the 1980s the

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living conditions of Roma have been repeatedly a matter of concern in resolutions and recommendations passed by the Commission of the European Community and the European Parliament (Hornberg 2000, p. 24). The fate of Roma in former communist states has received increasing attention since the end of the Soviet Union. According to Rövid (2011, p. 55) the fear of Romani immigration, transnational pro-Roma advocacy, the struggle for transnational Roma self-determination, the inadequacy of the human rights regime and the changing role of the European Union have lead to the internationalisation of what Rövid calls the "Roma issue".

In order to quantify the extent of disadvantage and discrimination Roma face, the need to collect ethnically disaggregated data has been repeatedly put forward by International Organisations (European Commission 2004, p. 47; Guy – Liebich – Marushiakova 2010, p. 24; Halász 2008, p. 26; Lansdown 2011, p. 39; McDonald – Negrin 2010, p. 35; Open Society Institute 2006, p. 2; Ringold – Orenstein – Wilkens 2005, p. 187). Data about Roma are usually based on what is imagined to be Roma ethnicity. One supposedly adequate definition of Roma ethnicity is based on Romani language. According to this conception, the term 'Roma' refers to all "Romani-speaking or formerly Romani-speaking groups" (Friedman 2003, p. 163). In many circumstances however it is not possible to determine whether one's ancestors have been Romani-speaking or not. Historically, different methods to identify Roma ethnicity have been applied (Mirga 2000, p. 9). Different methods of identification lead to different results. In many circumstances self-identification may lead to underestimations, for example if respondents fear stigma or discrimination. External-identification on the other hand bears the risk that stereotypes for example related to poverty guide identification. Data stemming from self-identification strongly differs from data stemming from external identification and also different modes of self-identification or external identification lead to different results: figures stemming for example from a household survey may differ from figures stemming from a population census, just as figures provided by researchers may differ from figures provided by local NGO's (e.g. Ladányi and Szelényi 2001). Data collection is moreover complicated by various meanings of the term "Gypsy". While in some instances the term refers exclusively to Roma groups, it may also refer to commercial nomads or peripatetics (Matras 1998, p. 53).

A first attempt to analyse the educational situation of "Gypsies" in Western Europe dates back to a resolution of the European Parliament and was coordinated by Jean-Pierre Liégois at the University René Descartes in 1984-85. The synthesis report of Liégois used data from country studies reporting the state of literacy, enrolment and attendance rates of "Gypsies and Travellers" in various Western European Countries (Liégeois 1998, p. 73-97). In order to

provide international comparative data on Roma households, the World Bank in cooperation with a team of researchers from the Yale Sociology Department used ethnic oversamples in household surveys to provide attainment and enrolment data for Roma in Bulgaria, Hungary and Romania (Revenga – Ringold – Tracy 2002, p. 24-26). The United Nations Development Programme (UNDP) went a step further and collected Roma household surveys in Central Europe in 2001 and 2002 as well as in Central and Southeast Europe in 2004, using a three stage random sampling design to identify Roma ethnicity. These surveys provided a wide range of international comparative education data on attainment, enrolment, segregation and language use (Ivanov et al. 2002, pp. 53-62; UNDP 2005; Ivanov et al. 2006, pp. 29-36; Milcher 2013).

The establishment of the Decade of Roma Inclusion 2005 to 2015 – an initiative driven by International Organisations and eleven Central and Eastern European countries and Spain – supported the plea for ethnic data, demanding reliable indicators to be used for monitoring Decade related goals (Decade Steering Committee 2004, p. 5). One of the Decade's objectives: "closing the gap in educational outcomes between Roma and Non-Roma" has even been institutionalised with the establishment of the Roma Education Fund, a grant-giving organisation with a notable budget that also carries out own research (Surdu – Friedman 2013). The importance of data collection was further strengthened by the EU Framework for National Roma Integration Strategies up to 2020. The Framework requests all member states to develop Roma integration strategies and define Roma integration goals and underlines the necessity "to put in place a robust monitoring mechanism with clear benchmarks which will ensure that tangible results are measured" (European Commission 2011, p. 13).

Following the political demand for monitoring ethnic inequalities, two Roma household surveys were conducted in 2011 – by the EU Fundamental Rights Agency (FRA) and the UNDP in cooperation with the World Bank. Together surveys cover eighteen countries with five new EU member states being covered by both surveys (FRA – UNDP 2012, p. 11)[3].

The surveys offer an unprecedented wealth of data on the educational situation of Roma in Europe, including data on pre-school education, parenting practices, self-perceived learning and literacy, attainment, enrolment, language use and educational segregation (Brüggemann 2012).

However, household data does provide only limited information about educational outcomes. Household surveys indicate for example to what level

[3] The following countries are covered solely by the FRA Roma pilot survey 2011: Greece, Spain, France, Italy, Poland and Portugal. The following countries are covered solely by the UNDP/World Bank/European Commission regional Roma survey 2011: Albania, Bosnia and Herzegovina, Croatia, Macedonia, Moldova, Montenegro and Serbia. The following countries are covered by both surveys: Bulgaria, the Czech Republic, Hungary, Romania and Slovakia.

individuals have studied but they do not provide information about to what extend people are competent to use what they have or should have learned. It is possible to assess how many Roma have not completed compulsory schooling or upper secondary education. Nevertheless, it is not known if those who completed compulsory education are able to understand, use and reflect upon written texts. While educational attainment data may for example give information about the share of people who have (at least formally) access to skilled labour, those data does not provide information about basic competencies necessary to perform certain tasks. Contrary to household surveys, international student assessments allow to measure and assess the knowledge and skills students have acquired. While household surveys collect information about formal or subjective learning outcomes, international student assessments measure students' actual learning outcomes.

Against this background we explore possibilities to measure and compare learning outcomes of Roma students. We first discuss the potential of international student assessments to stimulate debate about equity in education. We then introduce data on Roma students derived from PISA 2009 and set out reasons to explain the underrepresentation of Roma students with recourse to data from the UNDP Roma survey of Slovakia 2010 and the above mentioned UNDP/World Bank/European Commission regional Roma survey [4] Subsequently we analyse demographic characteristics and competencies of Romani-speakers in Slovakia. Finally, we discuss possibilities to improve the collection of data about learning outcomes of Roma students.

PISA and educational equity

Many countries around the world, including most South Eastern European countries, have been participating in one or more international student surveys. Launched in 2000, OECD's Programme of International Student Assessment (PISA) assesses competencies of 15-year-olds in reading, mathematics and science. By doing so, the survey seeks to evaluate quality, equity and efficiency of school systems on an internationally comparative level (OECD 2010a). Besides PISA, other international studies are the Trends in International Mathematics and Science Study (TIMSS) – carried out since 1995 and the Progress in International Reading Literacy Study (PIRLS) – carried out since 2001by the International Association for the Evaluation of Educational

[4] The UNDP Roma survey Slovakia 2010 covered 720 Roma households (3614 individuals) and 360 households (1083 individuals) situated in close proximity to Roma households (for details: Filadelfiová & Gerbery 2012, p. 11). The UNDP/World Bank/European Commission regional Roma survey covered 750 Roma households and 350 households situated in close proximity to Roma households in each country (for details: FRA & UNDP 2012, p. 29-31). The selection of sampling units for Slovakia in both surveys was based on the Atlas of Roma Communities – a survey of Roma settlements that includes 1,573 Roma settlements throughout the Slovak Republic (see Radičová et al. 2004). The surveys are not representative for all Roma living in Slovakia as they do not cover localities in which Roma are underrepresented.

Achievement (IEA). TIMSS tests students' competencies in mathematics and science at grades 4 and 8, PIRLS does the same for reading literacy.

Since the 1990s international student assessments, especially PISA, have received increasing public attention and its coordinating organisations have gained substantial influence in shaping educational discourse around the world. Policy makers have used international student achievements studies as points of reference to generate reform pressure or back up educational reforms (Grek 2009, Jakobi – Martens 2010). Especially international league tables for student performance have often been the centre of attention (Steiner-Khamsi 2003, p. 1) most probably because of their simplicity. Performance comparisons have gradually developed into a mode of governance (Nóvoa – Yariv-Mashal 2003, p. 425; Martens – Niemann 2010) and put education systems under pressure of increasing performance.

In most countries however, not only performance but also equity within the education system has attracted public attention. A common understanding of equity in education is that all students reach at least a basic minimum level of skills[5] and that personal or socio-economic circumstances, such as gender, ethnic origin or family background, do not present obstacles for educational success (OECD 2012, p. 15). PISA and other international student surveys allow measuring how certain background characteristics (such as gender, migration background or socio-economic status) influence learning outcomes. The fact that many of the best performing countries in PISA are those with low social inequalities has not only shown that it is indeed possible to combine excellence and equity, but have also supported the argument that high student performance can only be achieved by high levels of equity in the system. This has vitalised equity debates in many countries across the globe (Bellat-Duru 2011) and has further fortified the value of equity in education which has been an issue of public and professional discourse in Western European countries already since the 1970s.

An example that illustrates how international student surveys may trigger debates on equity is the educational discourse in Germany that developed after the publication of PISA 2000 results (Baumert et al. 2001). Not only that German students achieved lower than expected, also the performance gap between pupils with a low socio-economic status and those with a high socio-economic status as well as between students with and without migration background were found to be extraordinarily high. The discussions around those "deficits" were soon referred to as "PISA Shock" and results were discussed almost daily in the German media (Steiner-Khamsi 2009, p. 47).

[5] The basic skills level is operationalized by the proficiency level 2 in the PISA test. "at which students begin to demonstrate the reading literacy competencies that will enable them to participate effectively and productively in life" (OECD 2010a, p. 51)

Even the UN Special Rapporteur on the right to education Vernor Muñoz (2007, p. 26-41) used PISA results extensively to criticise the extent of inequality in the German education system. The educational debate triggered by PISA has contributed to policy reforms to promote equity, such as early and individual promotion for low-performing students, special support for students with a migration background, and further expansion of all-day schools (KMK 2001, 2010).

The underrepresentation of Roma students in PISA

As presented above, some Eastern European countries, notably Bulgaria, FYROM, Slovakia, Romania, Serbia and Hungary, have large Roma populations. While in all these countries the share of Roma is estimated to be over 7% (Council of Europe 2010, online source), the number of Roma in school age is assumed to be much higher due to population characteristics. Slovak statisticians for example projected the share of Roma to be 8% in 2010 and the share of Roma aged six to 15 to be 15% in the same year (Vaňo 2004, p. 29).

All these countries, with the exception of FYROM, participated in PISA 2009. Thus, we assume that a considerable potential exists to provide achievement data for Roma students in these countries as international student assessments aim to be representative for the whole student population of a country. However, PISA (as well as other international student assessments such as TIMSS or PIRLS) does not collect students' ethnicity as a unique variable. While migrants are captured by a question about the country of birth (of the student and his/her parents) non-migrant minorities cannot be directly identified. To date identification of ethnic belonging is possible only indirectly via a question about the language spoken at home but in most cases countries do not provide the option "Romani" when asking which language is spoken at home.

Of the almost 500 000 students that were sampled in PISA 2009, only 83 were Romani-speakers, distributed over four countries; 53 Romani-speakers were sampled in Slovakia, 16 in the Czech Republic, 10 in Slovenia and 4 in Finland. In PISA 2006 out of about 400 000 sampled students 124 were Romani-speakers distributed over the same countries; 85 in Slovakia, 22 in the Czech Republic, 13 in Slovenia and 4 in Finland.

The largest– but still undersized share of Roma students can be found in Slovakia. Out of 4 555 students sampled in Slovakia just 53 students (1.2%) reported that they spoke Romani at home, whereas 3980 students (87.4%) reported that they spoke Slovak at home and 385 students (8.5%) reported that they spoke Hungarian at home (see Table 1). Roma and Hungarians are the most numerous ethnic minorities in Slovakia. Unlike Romani, Hungarian is a

language of school instruction in over 200 primary schools [6] situated in Southern Slovakia where most Hungarians live. Thus, in contrast to many Roma students, for most Hungarian students the language of assessment is also their mother tongue.

The results presented in this paper will focus on Slovakia. No attempt was made to examine performance of Roma students in the Czech Republic, Slovenia and Finland given the extremely small size of the sample which does not allow any analysis of the data.

Table 1: **Romani-speaking students participating in PISA 2009**

	Language spoken at home	**n**	**Observed %**
Slovak Republic	Slovak	3980	87,4
	Hungarian	385	8,5
	Romani	53	1,2
	Another language	44	1,0
	Total	4555	100,0
Czech Republic	Czech	5796	95,6
	Vietnamese	38	0,6
	Romani	16	0,3
	Russian	10	0,2
	Slovak	15	0,2
	Chinese	2	0,0
	Ukrainian	3	0,0
	Another language	16	0,3
	Total	6064	100,0
Slovenia	Slovenian	5629	91,5
	Other former Yugoslavian languages (SVN)	260	4,2
	Hungarian	28	0,5
	Romani	10	0,2
	Italian	8	0,1
	Another language	56	0,9
	Total	6155	100,0
Finland	Finish	4542	78,2
	Swedish	1083	18,6
	Russian	32	0,6
	Estonian	4	0,1
	Romani	4	0,1
	Another language	86	1,5
	Total	5810	100,0

OECD PISA 2009 Database.

While it is estimated that in Slovakia the share of Roma aged 15 is somewhere above 10%, the small number of Romani-speakers captured in PISA might be considered as surprising. Reasons for the underrepresentation of Roma students are manifold: (1) Roma students might speak other languages than Romani as the first home language or (2) might not want to identify

[6] Primary schools usually cover grades one to nine and thus provide primary and lower secondary education. Basic data about education in Slovakia is provided by the Slovak Institute of Information and Prognoses of Education (www.uips.sk).

themselves as Romani-speaking in order to avoid stigmatisation and discrimination. (3) Moreover, a considerable share of Roma students might be absent from school or attend school on an irregular basis or (4) might be among those 15 year olds that are excluded from PISA. We will discuss all reasons in some detail before comparing PISA 2009 results of Slovak-, Hungarian and Romani-speakers.

1) Roma students might speak other languages than Romani as first home language. Romani is an Indo-Aryan language that has been spoken in Europe since the immigration of Roma groups in the late middle ages (Matras 2005, p. 1). Romani is one of Europe's largest minority languages with conservative estimates assuming over 3.5 million speakers (ibid. p. 2). Not all Roma speak Romani. Some Roma groups have not maintained the use of Romani voluntarily or because of enforced assimilation-policies for example during the reign of Habsburg monarchs Maria Theresa and Joseph II. Also nowadays Roma parents might decide not to use Romani in the household for example as a strategy to achieve social upward mobility. The share of Romani-speakers differs noticeably between countries. According to the regional Roma survey the share of Roma whose first home language is Romani ranges from 7% in Hungary to 70% in Serbia (Table 2). In Slovakia the number of Roma living in households that reported Romani as first home language is 68%.

Table 2: **Share of Roma living in households that use primarily Romani at home**

Country	Total number of respondents	Share of Roma that use primarily Romani at home
Bulgaria	3057	65%
Hungary	3204	7%
Romania	3514	44%
Serbia	3545	70%
Slovakia	3511	68%

UNDP/World Bank/European Commission regional Roma survey 2011

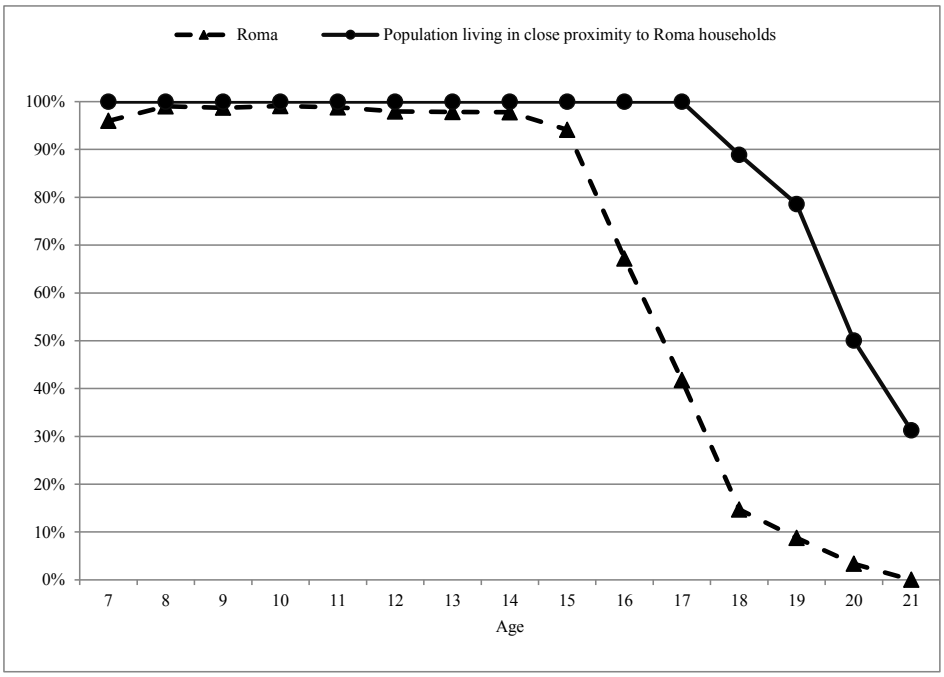
Thus, roughly one third of Roma living in Slovakia might not be captured by PISA, if ethnic belonging is identified exclusively through asking what language is spoken at home (assuming that all Romani-speakers would identify as such).

2) Roma students might not want to identify as Romani-speaking in order to avoid stigmatisation and discrimination. While many Roma might be defined by outsiders according to skin colour, language, poverty, family name or place of residence, self-identification leaves room for personal choice. Even though using Romani at home Roma students – especially those who try to assimilate or fear discrimination – might choose not to identify as Romani-speaking. Apart from few private schools and pilot projects Romani is not taught in

Slovak schools nor considered as an academic language. Speaking Romani is not associated with advantages of bi- or multilingualism but those who speak Romani are rather considered as unwilling to integrate. Given the strong discrimination and stigmatisation of Roma and Romani language (e.g. Pulis 2003), assessments are likely to underrepresent the share of Roma students. The negative influence of discrimination and stigmatisation on Romani self-identification and especially evidence about the strength of this effect has yet to be shown empirically.

3) Roma students might be absent from school or have dropped out of school before the age of 15. Compulsory schooling in Slovakia covers a period of ten years, students aged six to 16 are obliged to attend school. According to the UNDP Roma survey Slovakia 2010 school attendance rates of Roma students drop from the age of fourteen while attendance rates of students living in close proximity to Roma households drop from the age of eighteen (Figure 1).

Figure 1: **School attendance rates of Roma students (N=1194) and students living in close proximity to Roma household (N=184) aged seven to 21**



UNDP Roma survey Slovakia 2010

As shown in Figure 1, no school attendance was indicated for 6% of 15 year-old Roma students covered by the household survey. Even though those

students might be officially enrolled in school, the survey result suggests that for whatever reason those students do not attend school and thus would not be covered by student assessment tests. Furthermore, data from the regional Roma survey suggest that a considerable share of Roma students that attend school, attend school on an irregular basis (Brüggemann 2012 p. 46, for household data; Kusá et al. 2011, for a case study). Irregular attendance further adds to the underrepresentation of Roma students in PISA.

4) Roma students might be among those 15 year-olds that are excluded from PISA. Sampling standards allow for the exclusion of up to 5% of the population by excluding single students or entire schools (OECD 2010a, p. 171). Among PISA participating countries with considerable Roma minorities Slovakia is with an overall exclusion rate of 4.6% the country who excludes the highest share of students from the sampling (Table 3).

Table 3: **School level, within-school and overall exclusions rates of selected PISA participants**

Country	School-level exclusion rate	Within-school exclusion rate	Overall exclusion rate
Bulgaria	1.9%	0.0%	1.9%
Hungary	2.8%	0.3%	3.1%
Romania	0.5%	0.0%	0.5%
Serbia	2.2%	0.2%	2.3%
Slovakia	2.5%	2.1%	4.6%

OECD (2010a, p. 174)

Students can be excluded from PISA because of an intellectual or functional disability or a limited proficiency in the test language and schools can be excluded when specialized on children with disability or geographically inaccessible (ibid, p. 172). The Slovak special education system is well established and a high share of students is taught in special schools or special classes for pupils with a mental disability. Roma are strongly overrepresented in special schools and special classes in Slovakia. According to the UNDP Roma survey Slovakia 2010 about one out of five Roma aged seven to 15 enrolled primary or lower secondary education attended a special school for pupils with mental disabilities or a special class in a regular school. The share of Roma students enrolled in special education settings is statistically significantly higher compared to students living in close proximity to Roma households (Table 4).

Compared to Roma who speak Slovak or Hungarian, Romani-speaking Roma even face significant higher chances to end up in special schools or classes (Brüggemann 2011, p. 203; Friedman et al. 2009, p. 61). It is likely that the strong overrepresentation of Roma students in special schools and classes leads to an underrepresentation of Romani-speaking students sampled in PISA.

Table 4: **Roma students and students living in close proximity to Roma households aged seven to 15 enrolled in primary school (ISCED 1/2)**

	Roma students (n=753)	Students living in close proximity (n=90)
Regular class in a regular primary school	80%	98%
Special class in a regular primary school	4%	0%
Special primary school for pupils with mental disabilities	16%	2%

UNDP Roma survey Slovakia 2010, Brüggemann & Škobla (2012, p. 2)

PISA assessments target students enrolled in an educational institution with Grade 7 or higher (OECD 2010a, p. 171). Even though students aged 15 usually attend grade 7 or higher a considerable share of Roma students might not do so due to a combination of late school entry, enrolment in zero classes and grade repetition. Zero classes that exist in Slovakia since the school year 1991 – 1992 and are part of the state education system since 2002 have been designed to support school readiness of disadvantaged children (Friedman 2011, p. 17). Zero classes have been observed to be especially present in areas with above average Roma population (Sobodka, 2001, p. 184) and in many instances must be considered as de-facto segregated education settings for Roma students (Kusá et al. 2011, p. 321). Zero classes are part of compulsory schooling and thus students that have been enrolled in zero classes end compulsory schooling at a lower grade than students that have not been enrolled in zero classes. The overrepresentation of Roma students in zero classes as well as late school entry and grade repetition (see analysis of PISA data below) further contributes to the exclusion Romani-speaking students from student assessments.

Characteristics and learning outcomes of Romani-speaking students in PISA 2009

The strong underrepresentation of Romani-speakers presents only limited possibilities for the disaggregation of Slovak PISA data according to linguistic categories. Nevertheless we attempted to analyse the data, not at least as there is no other data available that would allow obtaining results on performance and schooling characteristics of Roma students compared to their peers in the country. Therefore, results presented below should be treated with caution. Standard errors, which are reported for all results, are in general much larger for small sample sizes. Yet, due to very large differences between Romani-speakers and Slovak- and Hungarian-speaking students most results are significant despite large standard errors. We first analyse demographic and schooling characteristics and point to inequalities regarding family background, pre-school experience and grade repetition. Subsequently, we examine

performance gaps and investigate how much variance in learning outcomes is mediated by various context factors[7].

Demographic and schooling characteristics of Romani-speaking students

Demographic and schooling characteristics of Romani-speaking students show considerable differences compared to Slovak- and Hungarian-speaking students (Table 5). Females are underrepresented among Romani-speaking students (39%) but not among Slovak- or Hungarian-speaking students (over 50%). Compared to their peers Romani-speaking students are less often to be found in city schools (3%) but more frequently in village schools (45%). Romani-speakers come from more disadvantaged family backgrounds than their peers. Students' socio-economic background is summarised in the PISA index of social, economic and cultural status (ESCS). [8]The gap on the *ESCS* between Romani-speaking students and their peers from other language groups is more than one standard deviation. While Slovak students have a socio-economic background that is close to the average OECD students (-0.05), Romani-speaking students have a value of -1.47 on this index and thus belong to the most disadvantaged students internationally.

The analysis also shows that many Romani-speaking students did not attend pre-primary education (41%) compared to few Slovak- and Hungarian-speaking students (less than 5%). Pre-primary education for two years or more is almost universal in Slovakia. This however does not hold true for Romani-speaking students as less than one third attended pre-primary education for more than one year. Recent data from 2011 for Roma students now at pre-primary age give reason to assume that pre-primary attendance rates remain low (De Laat et al. 2012, p. 12).

[7] All subsequent analysis is conform to PISA standard data analysis procedures as described in the PISA Data Analysis Manual (2009). Due to the two-stage sampling design applied in PISA, and the use of imputation methods (plausible values) for reporting student performance, specific statistical methodologies have to be applied. In order to facilitate computation and to apply identical procedures used for the production of the OECD PISA reports, the OECD provides macros which are available on the PISA website (www.pisa.oecd.org).

[8] This index is calculated by taking into consideration the parents' education and occupations and an array of household possessions. The index is standardised to have a mean of zero and a standard deviation of one across countries in the OECD area. An index of -1.0 means that a student is more advantaged than about one in six students in the average OECD country, having a score of +1.0 means being more advantaged than five-sixths of the students.

Table 5: **Demographic and schooling characteristics of Slovak-, Hungarian- and Romani-speaking students according to PISA 2009**

		Slovak		Romani		Hungarian		Difference between Slovak- and Romani-speaking students		Difference between Hungarian- and Romani-speaking students	
			S.E.		S.E.		S.E.		S.E.		S.E.
Sex	Female students (%)	50,9	(1,7)	39,1	(7,2)	52,4	(4,8)	11,8	(7,4)	13,3	(8,7)
Index of economic, social and cultural status (ESCS)	Mean index	-0,05	(0,02)	-1,47	(0,12)	-0,24	(0,10)	**1,4**	(0,1)	**1,2**	(0,2)
Highest level parents schooling	Years of schooling (years)	13,3	(0,1)	11,1	(0,5)	12,9	(0,2)	**2,2**	(0,5)	**1,8**	(0,5)
Pre-primary school attendance	No attendance (%)	4,4	(0,4)	40,7	(9,6)	3,5	(1,5)	**-36,2**	(9,6)	**-37,2**	(9,7)
	One year (%)	12,5	(0,7)	29,1	(9,1)	6,9	(1,7)	-16,6	(9,1)	**-22,2**	(9,2)
	More than one year (%)	83,1	(0,8)	30,3	(6,6)	89,6	(2,3)	**52,8**	(6,7)	**59,4**	(7,0)
School entry age	Mean	6,3	(0,0)	6,6	(0,1)	6,4	(0,1)	**-0,3**	(0,1)	-0,1	(0,2)
Grade repetition: primary education	No (%)	99,1	(0,2)	69,5	(10,7)	95,2	(2,0)	**29,6**	(10,7)	**25,7**	(10,9)
	Once (%)	0,9	(0,2)	19,2	(8,0)	4,0	(1,7)	**-18,4**	(8,0)	-15,2	(8,2)
	Twice or more (%)	0,1	(0,1)	11,3	(4,4)	0,8	(0,5)	**-11,2**	(4,4)	**-10,5**	(4,4)
Grade repetition: lower secondary education	No (%)	98,5	(0,3)	83,3	(8,4)	95,0	(1,7)	15,3	(8,4)	11,7	(8,6)
	Once (%)	1,1	(0,3)	16,7	(8,4)	4,0	(1,5)	-15,6	(8,4)	-12,7	(8,5)
	Twice or more (%)	0,3	(0,1)	0,0	c	1,0	(0,6)	0,3	c	1,0	c
Grade	7 (%)	0,5	(0,2)	19,8	(5,7)	1,1	(0,8)	**-19,3**	(5,7)	**-18,7**	(5,8)
	8 (%)	1,8	(0,3)	33,3	(7,0)	3,9	(1,5)	**-31,5**	(7,0)	**-29,4**	(7,2)
	9 (%)	34,9	(1,7)	24,8	(7,0)	44,5	(10,3)	10,1	(7,2)	19,7	(12,5)
	10 or above (%)	62,8	(1,8)	22,1	(9,1)	50,5	(10,8)	**40,7**	(9,2)	**28,4**	(14,1)
Relative grade	Mean	-0,4	(0,02)	-1,5	(0,21)	-0,5	(0,14)	**1,2**	(0,2)	**1,0**	(0,3)
Programme attended, among students in grade 10 or above	Academic (%)	87,0	(1,8)	5,6	(6,1)	76,3	(11,4)	**81,4**	(6,4)	**70,7**	(13,0)
	Vocational (%)	13,0	(1,8)	94,4	(6,1)	23,7	(11,4)	**-81,4**	(6,4)	**-70,7**	(13,0)
School location	Village (%)	8,9	(1,6)	44,8	(13,1)	21,7	(8,1)	**-35,9**	(13,2)	-23,1	(15,4)
	Small town (%)	17,0	(3,8)	21,6	(11,8)	32,8	(11,0)	-4,7	(12,4)	11,2	(16,1)
	Town (%)	55,4	(4,1)	31,1	(10,6)	42,1	(11,4)	**24,3**	(11,4)	11,0	(15,6)
	City (%)	18,7	(2,7)	2,5	(1,6)	3,4	(1,8)	**16,2**	(3,2)	0,9	(2,4)

Differences that are statistically significant on a significance level of 0.05 are marked in **bold**.
Example: The share of Romani-speaking students that as attended primary school is 36.2 percentage points lower compared to Slovak-speaking students
OECD PISA 2009 Database

Romani-speaking students show higher class repetition rates than their peers. Less than three percent of Hungarian- and Slovak-speaking students repeated one year or more in primary school, compared to 30 percent of Romani-speaking students. The same holds true for lower secondary education, where

again Roma students show much higher repetition rates than their peers. In light of these findings it is not surprising that Romani-speaking students are in lower grades than their peers. Later school entry age for Romani-speaking students than students from other language groups additionally accrue here. Every fifth Roma student is still in grade 7 versus less than one percent among the other language groups where the majority attends grade 10 or above. Yet, less than one quarter of Roma students has proceeded to grade 10 at the age of 15.

Almost all Romani-speakers can be found in vocational tracks whereas the large majority of their Hungarian- or Slovak-speaking peers attend academic tracks. Taking into consideration students only that attend grade 10 or above as tracking of students to academic or vocational schools takes place from this grade level onwards in the Slovak Republic, 95% of Romani-speaking students attend vocational schools while it is 13 percent for Slovak-speaking students and 24% of Hungarian-speaking students.

In consideration of findings showing differences in demographic and schooling characteristics between students are often accompanied with differences in performance, it is not surprising that analysis of learning achievement also shows substantial disparities of Romani-speakers compared to speakers of Slovak and Hungarian.

Learning outcomes of Romani-speaking students

Romani-speakers perform significantly worse in all disciplines than their peers (Table 6). Romani-speakers achieve 321 score points in reading, 342 score points in mathematics and 315 score points in science. This is about 150 score points below average performance of all students. As 39 score points correspond to one year of schooling, Romani-speakers lag thus behind their peers by almost 4 years of schooling. The great majority of Romani-speaking students (96 %) performs below Level 2, the baseline level, compared to about one out of five Slovak-speaking students.

Because learning outcomes are correlated to the socio-economic background of students, it is important to consider this factor when looking at student results in PISA. Low socio-economic background of students and low performance converge; disadvantaged students are at higher risk of low performance than their more advantaged peers. The influence of students' socio-economic background on their performance varies between countries. Across OECD countries, 14.0% of the variance in national student performance is explained by students' socio-economic background. Slovakia is with 14.6% explained variance in student performance close to the OECD average (OECD 2010b, p. 167).

Table 6: **Performance in reading mathematics and science of Slovak, Hungarian and Romani-speaking students according to PISA 2009**

	Reading		Mathematics		Science		Percentage below Level 2 in reading		Top-performers in reading	
	Mean score	**S.E.**	**Mean score**	**S.E.**	**Mean score**	**S.E.**	**%**	**S.E.**	**%**	**S.E.**
Slovak	485	(2,8)	504	(3,0)	497	(3,2)	17,9	(30,9)	9,4	(48,0)
Romani	321	(7,3)	342	(15,2)	315	(16,1)	93,5	(87,0)	0,0	c
Hungarian	449	(16,9)	473	(16,6)	466	(15,1)	26,9	(12,8)	4,8	(57,0)
Difference between Slovak- and Romani-speaking students	**162**	(6,3)	**182**	(6,5)	**164**	(4,8)				
Difference between Hungarian- and Romani-speaking students	**131**	(22,5)	**151**	(22,0)	**128**	(18,4)				

Differences that are statistically significant on a significance level of 0.05 are marked in **bold**.
Example: The mean score difference in reading between Romani-speaking students and Slovak-speaking students accounts for 162 points.
OECD PISA 2009 Database.

One way to measure the extent to which contextual factors affect the performance of students is to adjust performance outcomes for socio-economic background, assuming that Roma students have the same socio-economic background of their Slovak-speaking peers. Such an adjustment is obviously entirely hypothetical: students operate in a market environment where actual, rather than adjusted, performance in cognitive skills and abilities – and non-cognitive skills beyond PISA's measure – is what matters.

Results from simple linear regression analysis show, that Roma students' disadvantaged family background explains to some extent their huge performance gap in relation to their peers (Table 7). After controlling for socio-economic background, the performance gap between Slovak and Roma students decreases from 164 to 110 score points. Thus, family background explains 54 score points of the performance gap between these two groups. Both differences in socio-economic background and pre-primary school attendance explain 64 score points of their performance gap.

As pointed out above Romani-speaking students enter school at a later age and repeat grades more frequently. Moreover, Roma are overrepresented in vocational tracks. As lower test scores may be due to the attendance of lower grade or enrolment in a vocational track instead of an academic track we also repeat simple regression analysis taking grade repetition, grade attendance and type of school students attend into account. The grade attended when sitting the PISA test explains again 55 score points of the performance gap between Slovak and Romani-speaking students. Thus, the performance gap decreases

from 164 to 108 score points, after controlling for the grade attended. Roma students' more frequent grade repetition compared to their peers explains 50 score points of the performance gap them and Slovak students. If controlling for both grade attendance and repetition, as these factors relate to each other, the performance gap decreases by further 20 score points and remain at 92 score points difference between the two groups.

Results after controlling for type of programme (vocational and academic) are not statistically significant. Neither does Roma students' later school entry explain the performance gap to their Slovak peers, nor do differences in the school location. Controlling for differences in attendance of pre-primary school alone is not significant either.

Table 7: **Performance gab between Slovak-speaking students and their Romani and Hungarian speaking peers after accounting for selected schooling and family characteristics (Simple Linear Regression analysis)**

	Romani-speaking students compared to Slovak-speaking students		**Romani-speaking students compared to Hungarian-speaking students**		**R-SQUARE**	
	Score difference	**S.E.**	**Score difference**	**S.E.**	**Mean**	**S.E**
Null-Model	-164	(7,6)	-128	(18,3)	0,06	(0,02)
Model 1: ESCS	**-110**	(9,3)	-82	(16,2)	0,17	(0,02)
Model 2: Pre-primary school attendance	-147	(22,1)	-110	(18,7)	0,06	(0,02)
Model 3: Pre-primary school attendance and ESCS	**-100**	(10,6)	-92	(17,1)	0,17	(0,02)
Model 3: Grade level	**-108**	(12,4)	-81	(18,5)	0,17	(0,02)
Model 4: Programme	-146	(13,8)	-114	(18,3)	0,15	(0,02)
Model 5: Grade repetition	**-114**	(12,5)	-88	(18,8)	0,11	(0,02)
Model 6: Grade repetition and grade level	**-92**	(16,2)	-69	(20,9)	0,18	(0,02)
Model 7: School location	-146	(9,6)	-121	(18,0)	0,09	(0,02)

Differences between the Null-Model score difference and the score difference of the individual models that are statistically significant on a significance level of 0.05 are marked in **bold.** (Null-Hypothesis: the score point difference without controlling for other variables is the same as the score point difference after accounting for other variables as specified in models 1 - 6).

Example: The mean score difference in reading between Romani-speaking students and Slovak-speaking students after controlling for students' economic, social and cultural status accounts for 110 points. The different socio-economic background of Romani- and Slovak-speaking students explains 54 score points of their performance gap. The interpretation for the models 3 and 6 are similar. If differences in pre-primary school attendance and students' socio-economic background are accounted for (as if students had the same length of pre-primary school attendance and the same socio-economic background) the performance gap between Slovak and Roma students was 100 score points so that the two variables explain 64 score points of the performance gap.

For the syntax of this simple linear regression see OECD 2009 p. 123, Box 8.5 and for more information on simple linear regressions see OECD 2009 p.112-124 and 200-202.

OECD PISA 2009 Database.

Due to very small sample sizes in particular for Romani-speakers, results can only be considered as first indication of learning characteristics and outcomes for Roma students that need to be investigated further. Despite these shortcomings, results overall speak for various disadvantages Romani-speaking students face.

Summary and prospects

International Organisations have repeatedly highlighted the need for the collection of ethnically disaggregated data in order to monitor the living conditions of Europe's Roma minorities. Two political frameworks, the Decade of Roma Inclusion and the EU Framework for National Roma Integration Strategies have triggered considerable political pressure to define and monitor benchmarks and targets related to Roma inclusion/integration. In this context several international comparative household surveys have been undertaken, the most recent one provides data about living conditions of Roma and their direct neighbours in eighteen countries. Household surveys allow for the calculation of a wide range of educational indicators. Nevertheless, outcome indicators that ask to what extend individuals master certain skills or competencies are based on the perceptions of the respondents and thus do not provide the same information about learning outcomes as standardised student assessments do.

International student assessments like PISA have increasingly gained public attention. PISA has generated discussions about the quality and efficiency of education systems and indirectly driven education reforms in many countries. PISA has also triggered discussions about educational equity, especially with regard to the achievement gap of students with a low socio-economic status or migration background. PISA and other international assessments have however failed to provide data about learning outcomes of non-migrant minorities. Hardly any data about learning outcomes of Roma pupils is available, even though the number of Roma in many European countries is considerable.

Five countries with a significant share of Roma participated in PISA 2009: Bulgaria, Hungary, Romania, Serbia and Slovakia. Among these countries only Slovakia has included "Romani language" as an option to choose between different languages students speak at home. Slovakia is thus the only country that allows for a reanalysis of PISA data disaggregated for Romani-speaking students. Out of 4555 students that participated in PISA Slovakia, just 1.2% indicated to speak Romani as first home language. Expert estimations however assume the share of Roma students to be many times higher. The underrepresentation of Roma in the PISA sampling has multiple reasons: About one out of three Roma in Slovakia does not use Romani as first home language and the belonging to a national or ethnic minority is not assessed in PISA. Furthermore, Roma might not want to identify as Romani-speaking because

they fear discrimination or because they do not consider Romani as an academic language that one should refer to in tests or formal contexts. Moreover, a certain share of Roma does not attend school on regular basis. Last but not least many Roma belong to the share of students in Slovakia excluded from PISA, for example because they attend a special school or class or because they attend (at an age of 15) grades lower than seven.

The underrepresentation of Romani-speaking students leads to a very small sample size and thus the analysis of PISA data disaggregated for Romani-speaking students must be interpreted with caution. Despite these shortcomings, this paper has outlined some key results for Roma students with the PISA sample 2009 from Slovakia. The analysis of PISA data shows that Romani-speaking students face considerable disadvantages compared to Slovak- and Hungarian-speaking students. Not only do they come from more disadvantaged socio-economic backgrounds, but also do they show schooling and learning characteristics that are negatively associated with performance, notably fewer pre-school experience and higher share of students in vocational tracks with direct access to the labour market. They also repeat classes more frequently during their school career and, related to this, are in lower grades than their peers at age 15. The performance gap to their peers presents as much as more than 4 years of regular schooling. It is obvious that Romani-speaking students thus face multiple disadvantages that may present severe barriers for success in society and labour market.

Several steps can be taken in order to improve the monitoring of ethnic differences in educational achievement.

In countries where a considerable share of Roma is streamed into special schools such as Slovakia underrepresentation might be avoided by reducing either the streaming of Roma in special schools and classes or a more conscious approach to PISA sampling rules that allow for the exclusion of up to 5% of the student population. Early dropout and irregular attendance also add to the underrepresentation of Roma students and might be prevented by measures that ensure full compulsory schooling for all children. As long as this is not achieved international student assessment studies such as PIRLS or TIMSS which measure educational achievement of younger students have compared to PISA a higher potential to reach adequate sample sizes.

All countries with considerable Roma minorities might assess whether the student is Romani-speaking or not by providing the option “Romani” on the question what language the student speaks at home. In light of the fact that not all Roma populations – in some countries even only a minority, speaks Romani, this option may improve the coverage of Roma students but will not be sufficient. A second step might thus be the inclusion of an additional question about the belonging to an ethnic or national minority. Especially in Hungary,

the country with the lowest share of Romani-speakers a question about the belonging to an ethnic or national minority would be indispensable to ensure an adequate sample size. A condition for self-identification might be that students feel comfortable with identifying themselves as Roma and/or Romani-speaking. We assume that the share of students identifying as Romani-speakers rises if Romani is appreciated as a language with equal status to other European languages.

The introduction of Romani language as a response option to the question about the language spoken at home and the introduction of a variable on ethnic self-identification of students are comparably cost-efficient possibilities to gather achievement data on Roma students (Baucal 2009). The introduction of variables and response options can be realised as a national option. Thus, no international agreement is needed on this issue.

In countries with smaller Roma population and in countries where the introduction of a variable on ethnic self-identification does not lead to necessary sample sizes to gain significant results an oversample might be the only option to ensure adequate number of Roma students participating in international assessments (ibid.). Oversampling can be decided on a national level and it seems that Serbia has experiences with collecting additional PISA data on Roma students by merging PISA data with data from national assessments (Pavlović-Babić – Baucal 2010 cited in Søndergaard et al. 2012, p. 118).

It may be useful for Central and South-East European countries with considerable Roma minorities to jointly agree on the inclusion of an additional variable covering ethnic belonging. This would allow for analysis and comparison of learning outcomes of Roma students across the region which may give important insights in differences between Roma and their peers and how this relates to differences in terms of organisation and governance of the education systems.

We assume that the introduction of a variable asking for the belonging to an ethnic or national minority has a high potential to improve the monitoring of Roma students in countries with large Roma populations. In countries with smaller Roma populations the introduction of an oversample also bears potential to improve data collection. There is clearly a hidden potential of international student surveys to report about the educational situation of Roma and to contribute to monitoring systems such as the Decade of Roma Inclusion or the EU Framework of National Roma Integration Strategies. Nevertheless, we do not want to judge the political desirability for improved data collection without pointing to possible pitfalls. Ethnicity remains a highly contested variable in social science research and different forms of operationalizing ethnicity lead to different results. Furthermore, international assessments might

be used to over-emphasize ethnic (or cultural) differences and a certain risk remains that disaggregation might be used to the disadvantage of minorities.

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