



Original research article

The influence of social exclusion on the cognitive abilities of Roma children

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Abstract

This article aims to analyse the connection between factors of social exclusion and cognitive development in Roma children.

Methods: The research group included 400 Roma children aged 7–11 years (ethnicity based on self-identification) and their parents. They were quota selected from all regions of the Czech Republic, from socially excluded localities and beyond. We used the Woodcock–Johnson IV COG comprehensive intelligence test battery as a research tool to measure cognitive abilities. We measured social exclusion with the newly created Social Exclusion Scale test. We used the SPSS programme to process the data using correlations and regression analysis.

Results: Research shows a connection between social exclusion and the cognitive abilities of Roma children in the Czech Republic, but the correlation is not very strong. The cognitive abilities primarily include insufficient language skills and related communication skills in offices, schools, and other institutions. Another important factor are cultural specificities and differences of the Roma minority. For practical social work, working on developing knowledge of the Czech language among Roma families and helping with incomprehensible communication with the authorities seems crucial.

Keywords: Cognitive abilities; Education; Roma children; Social exclusion; Socially excluded locality; Woodcock–Johnson IV COG

Introduction

In the Czech Republic, a great number of questionnaires are currently used in educational and psychological counselling centres for intelligence level assessment, cognitive abilities assessment, and a child's preparedness for school. One of them is the Woodcock–Johnson IV COG. Currently, diagnosing children is a topic that resonates across school and counselling facilities, because a diagnostic tool – or the entire diagnostic process – can affect a child's success, inclusion, and the determination of appropriate support measures. In the Czech education system, members of ethnic and national minorities are part of the educational process. They may be disadvantaged due to several factors. Several studies have confirmed the influence of socioeconomic status (SES) on individual cognitive abilities. This article aims to analyse the connection between social exclusion (according to the Social Exclusion Scale questionnaire) and the cognitive development results in Roma children aged 7–11 years (determined using the Woodcock–Johnson IV COG comprehensive intelligence test battery). We see the significance of this analysis in proving the negative effect of exclusion on the cognitive abilities of Roma children and the postponement of their school attendance and success in school.

Theoretical basis

Social exclusion is one of the most pressing social problems in the Czech Republic. It is a process that excludes individuals, groups, or communities of people from accessing resources that are otherwise normally available to the rest of society (education, health care, services, etc.) (Peace, 2001). The Social Inclusion Strategy 2021–2030 (Ministry of Labour and Social Affairs, 2022) states that, after the homeless, the Roma are the most affected by social exclusion (Čada et al., 2015; GAC, 2006). Previous studies state that 85% of the inhabitants of socially excluded localities are Roma. Thus, social exclusion is strongly ethnicized (Vašat, 2021). Social exclusion is closely related to poor income but is not the same phenomenon. In addition to poverty, social exclusion also includes other phenomena, such as spatial segregation, stigmatization, a culture of poverty or the impossibility of executing one's rights (Kronauer, 2019). The environment of socially excluded localities is not very stimulating regarding children's school development. In overcrowded apartments, they often have no essential space for writing school assignments, and they do not have a corner where they can keep school supplies (Davidová et al., 2011). In addition, ethnically segregated schools are emerging in the vicinity of socially excluded localities supporting spatial and educational segregation (Nekorjak et al., 2011). Several sub-studies in the Czech Republic point to the poor-

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Submitted: 2022-06-14 • Accepted: 2022-10-03 • Prepublished online: 2022-10-25

KONTAKT 24/4: 324–330 • EISSN 1804-7122 • ISSN 1212-4117

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er school success rate of Roma children. The most well-known comprehensive document is GAC's Analysis of Attitudes and Educational Needs of Roma Children and Youth (GAC, 2007). It points out that Roma children have the most significant difficulties when transitioning to the second education grade, when new subjects appear that require more complex knowledge of the Czech language, including abstract terms. Many studies describe the reasons for this failure. They include different language development, different educational styles in families, underestimation of the importance of education, poor school preparation, social isolation of the excluded, and insufficient preparation of teachers for working with minorities (Opálková, 2022).

The influence of ethnicity on cognitive abilities has been discussed. The assumptions have been refuted by studies pointing out that socioeconomic status is a decisive factor influencing the difference in cognitive performance between ethnic minorities and the majority of society (Weiss and Saklofske, 2020). Globally, ethnic minorities face lower SES than majority members (Song et al., 2020). In other words, ethnicity and cognitive ability are linked through their average members' socioeconomic status. Rindermann et al. (2016) emphasise the need to consider the interdependence of these factors. Low SES initially creates poorer opportunities for quality education, resulting in low next generation's SES. This widens the differences in cognitive abilities between minority and majority populations. Engelhardt et al. (2018) explain differences in cognitive abilities using shared environmental influences, such as parents' SES, or the family's place of residence (neighbourhood). These environmental influences account for 79% of IQ in "verbal comprehension" and "reading", but only 50% in "math skills". The conclusion is that parental SES is one of the most significant predictors of children's school performance and cognitive abilities. Dolean et al. (2019) demonstrated that low socioeconomic status is a significant predictor of children's impaired reading skills and cognitive abilities in a set of Roma children in Romania. The authors found that low SES contributes significantly to increased school absence, further damaging the abilities mentioned above.

According to Cakirpaloglu and Kořínek (2014), the reason why SES is such an essential factor affecting cognitive performance is the non-stimulating disadvantaged environment in which the child grows up. It may be a socially excluded locality, as confirmed by Ferjenčík et al. (2015). According to Gaertner and Tellegen (2008) and Kassis (2020), the language barrier – bilingualism or the use of ethnolect – contributes negatively to this target group (Kyuchukov et al., 2019). Another reason, according to Kassis (2020), is the segregation and stereotyping of Roma children by the educational staff.

Materials and methods

The research group consisted of 400 Roma children aged between 7 and 11, and their parents, who were selected by age, gender, and locality. The participants came from all over the Czech Republic, and all regions were proportionally represented. A child's Roma ethnicity was determined based on their parents' self-identification as Roma. We selected respondents living in socially excluded localities and outside them. A trained interview team collected the data from March 2019 to November 2020 in the homes of Roma families, or in some cases in clubhouses of LTFCY (Low Threshold Facilities for Children and Youth). Social work organizations working with the Roma minority provided help with contacting respondents. As part

of the pre-research conducted with fifteen respondents, the following WJ IV COG tests were selected. They were focused on maintaining attention. Even in the case of only the selected tests, the administration took two hours on average for one family.

The initial research instrument for children were selected tests and sum scales of the fourth edition of cognitive ability tests as part of the Woodcock-Johnson battery (WJ IV COG). We used the test materials version that was intended to standardise the method in the Czech Republic, specifically the WJ IV COG tests: T1, T2, T3, T5, T6, T7, T9, T10, T11, T17. These tests were: Vocabulary, Numbers, Verbal Attention, Phonological Processing, Story Reproduction, Visualization, Concept Formation, Reversed Number Series, Number Search and Pair Search. These can be combined into subgroups BIA = brief intellectual ability, Gf = fluid intelligence, and Gwm = short-term working memory, which we work with further in the analyses.

An additional tool administered to parents was the Social Disadvantage Scale (POD), a standardised questionnaire diagnostic method aimed at assessing the degree of parent/caregiver-caused social disadvantage of children in kindergartens and primary schools (Seifert and Jelínek, 2019). The Social Disadvantage Scale is intended for the subjective assessment of parent-caused social disadvantage. It contains 20 items with a four-point Likert response scale (strongly disagree – somewhat disagree – somewhat agree – strongly agree) and the variant "I don't want to answer". The questions focus on socioeconomic status, social and cultural capital in the family, cultural differences, and child support, especially concerning school (Seifert et al., 2021). These methods were supplemented with other sociodemographic questions.

Statistical analysis was processed in SPSS. We tested the Social Disadvantage Scale (POD) for data distribution and examined its internal consistency. Due to the inclusion of non-response items, the total data from the Social Disadvantage Scale test was $N = 310$ when the total questionnaire score was tested against individual WJ IV COG outcome values using Pearson's correlation. Subsequently, it was used with other sociodemographic factors to calculate a multiple linear regression. Finally, we created a correlation matrix of the individual questions of the Social Exclusion Scale. The relationship of these items with the individual tests of the WJ IV COG was examined using Spearman's correlation. The level of significance was set at $p < 0.05$.

Results

The Social Disadvantage Scale questionnaire showed a good internal consistency value (Cronbach's $\alpha = 0.79$). As a one-dimensional tool, it demonstrated a significant relationship at the 5% level of significance with the overall level of cognitive abilities within the overall index of brief intellectual ability (BIA) $r = -0.136, p < 0.01$, short-term working memory (Gwm) $r = -0.178, p < 0.01$, and fluid intelligence (Gf) $r = -0.193, p < 0.01$. In the case of the relationship between the questionnaire and the individual tests of the WJ IV COG battery, significant results were found for the Social Exclusion Scale questionnaire in test 6 ($r = 0.108, p < 0.05$), 11 ($r = -0.100, p < 0.05$), and 17 ($r = -0.109, p < 0.05$). The coefficient here indicates a weak connection between the questionnaire result and cognitive abilities, which cannot be ignored due to the complex nature of cognitive abilities.

We used multiple linear regressions of the dependent WJ IV COG test (BIA, Gf and Gwm) variable scales. The predic-

tors were the data from the Social Exclusion Scale questionnaire. They were supplemented with the overcrowding index and scales evaluating the mother's and father's education. The results are presented in Table 1. As a significant predictor in the case of brief intellectual ability (BIA) variable, we identified overcrowding variables ($\beta = -0.14$, $t = -2.59$, $p = 0.01$) and the respondent's mother's education variable ($\beta = 0.10$, $t = 1.87$, $p = 0.02$). The fluid intelligence scale (Gf) was related to the crowding variable ($\beta = -0.14$, $t = -2.54$, $p = 0.01$) and the POD Social Disadvantage Scale questionnaire ($\beta = -0.17$,

$t = -3.08$, $p < 0.01$). Also, short working memory (Gwm) scale was related to socioeconomic factors represented by the Social Disadvantage Scale ($\beta = -0.14$, $t = -2.54$, $p = 0.01$). The level of the standardised coefficient β indicates a weak (0.1–0.17) but significant connection with the observed variables – in the case of partial cognitive functions, the primarily negative function of socioeconomic predictors (overcrowding, social exclusion) manifests itself. The global scale of cognitive abilities (measured within BIA) also shows a positive relationship with the mother's education.

Table 1. Regression analysis of the influence of individual sociodemographic predictors

Score	Predictor	B	Std. error	β	t	p -value
BIA	Overcrowding	-2.14	0.83	-0.14	-2.59	0.010
	Father's education	3.29	2.32	0.10	1.42	0.157
	Mother's education	6.08	2.62	0.16	2.32	0.021
	POD questionnaire	-4.99	2.67	-0.10	-1.87	0.062
Gf	Overcrowding	-2.01	0.79	-0.14	-2.54	0.012
	Father's education	1.41	2.23	0.04	0.63	0.526
	Mother's education	3.09	2.51	0.08	1.23	0.219
	POD questionnaire	-7.88	2.56	-0.17	-3.08	0.002
Gwm	Overcrowding	-1.66	0.89	-0.10	-1.87	0.062
	Father's education	3.14	2.50	0.09	1.26	0.209
	Mother's education	3.62	2.81	0.09	1.29	0.199
	POD questionnaire	-7.73	2.87	-0.15	-2.69	0.007

Legend: BIA = brief intellectual ability; Gf = fluid intelligence; Gwm = short-term working memory.

The following analyses deal with the relationship between the results of the investigated cognitive performance and the POD questionnaire's individual questions. The correlation matrix is presented in Table 2. Item 16 is crucial. It is focused on the schoolchild's language skills and shows a significant relationship with BIA ($\rho = -0.19$), Gf ($\rho = -0.16$), and Gwm ($\rho = -0.20$). Item 11 assesses the family's ability to deal with the authorities. This item is significant for all WJ IV COG sum scores, i.e., BIA ($\rho = -0.13$), Gf ($\rho = -0.14$) and Gwm ($\rho = -0.16$). Item 2 focuses on family habits in connection to BIA ($\rho = -0.097$) and Gwm ($\rho = -0.112$). Item 3 evaluates social support towards the Gf variable ($\rho = -0.086$). Item 5 focuses on the child's knowledge of majority customs and rules regarding Gf ($\rho = -0.124$) and Gwm ($\rho = -0.116$). In connection with Gf, items 8 ($\rho = -0.107$) and 12 ($\rho = -0.090$) show significance. They focus on child support, which is also part of item 14 concerning Gwm ($\rho = -0.088$). Reading to children (item 17) suggests an association with BIA ($\rho = -0.088$). Items 18 to 20 focus on attitudes towards school. Item 18 is related to Gf ($\rho = -0.108$) and Gwm ($\rho = -0.087$), similar to item 19, which

shows Gf ($\rho = -0.108$) and Gwm ($\rho = -0.102$). Item 20 is related to Gwm ($\rho = -0.099$).

We found the following relationships using the performed correlation analysis (Table 3). The recorded value was $p < 0.01$, namely for item 1 and test 17 – *Finding pairs* ($\rho = -0.14$), test 7 – *Visualization* ($\rho = 0.10$) and item 2 in test 2 – *Numbers* ($\rho = -0.127$). Item 5 showed a relationship with test 6 – *Story reproduction* ($\rho = -0.130$) and test 10 – *Inverted numbers* ($\rho = -0.145$), item 8 and test 9 – *Concept formation*. Item 11 showed a relationship with test 1 – *Vocabulary* ($\rho = -0.0$) and test 10 – *Inverted numbers* ($\rho = -0.0$), and item 10 with Test 5 – *Phonological processing* ($\rho = -0.155$). Item 16 showed the closest relationship with the results of cognitive abilities, i.e., with test 1 – *Vocabulary* ($\rho = -0.233$), test 3 – *Verbal attention* ($\rho = -0.186$), test 6 – *Story reproduction* ($\rho = -0.219$), test 9 – *Concept formation* ($\rho = -0.136$) and test 10 – *Inverted numbers* ($\rho = -0.155$). We can conclude that the most significant influence from the Social Exclusion Scale on the cognitive performance of Roma children is the ability to communicate in the Czech language and the family's cultural differences.

Table 2. Correlations between POD questionnaire items and cognitive ability sum scores

Spearman correlation (one-sided)	BIA	Gf	Gwm
1) Our family has a good social status ^R	0.05	0.04	0.01
2) Our family customs are significantly different from the customs of Czech society	-0.097*	-0.111*	-0.112*
3) We have many friends and acquaintances in our neighbourhood ^R	-0.02	-0.086*	-0.07
4) Sometimes we have trouble making ends meet	-0.02	-0.04	-0.04
5) Our child's life is complicated by the fact that he/she does not know local customs and rules very well	-0.08	-0.124**	-0.116*
6) We have a number of people we can turn to when we need help or arrangements ^R	-0.03	-0.08	-0.05

Table 2. (continued)

Spearman correlation (one-sided)	BIA	Gf	Gwm
7) I am satisfied with our family's current living situation ^R	0.04	0.01	-0.03
8) When my child wants advice about something at school, I usually refer him/her to someone else	-0.04	-0.107*	-0.04
9) We often spend time outside the home with our child, e.g., we take walks to interesting places ^R	-0.02	-0.06	-0.02
10) I can afford to buy my child anything he/she needs for school ^R	0.00	-0.04	-0.01
11) We have difficulty arranging things that are important to us at the authorities	-0.131**	-0.142**	-0.156**
12) I manage to support my son/daughter in school success as I see fit ^R	-0.04	-0.090*	-0.06
13) Our residence provides us with good conditions for life ^R	0.01	-0.02	-0.01
14) I don't know how to deal with the demands and tasks that our child brings from school	-0.03	-0.04	-0.088*
15) My son/daughter has good role models in his/her surroundings for his/her professional future ^R	-0.01	-0.06	-0.03
16) My son/daughter has difficulty communicating at school because he/she does not speak Czech well	-0.185**	-0.163**	-0.199**
17) In our family, it is common to read to/with children ^R	-0.088*	-0.06	-0.04
18) The school considers the specifics of our child and our family situation ^R	-0.06	-0.098*	-0.087*
19) It intensely bothers me what and how children have to learn at school	-0.08	-0.108*	-0.102*
20) The teachers have a positive attitude towards our child ^R	-0.04	-0.06	-0.099*

^R Reverse items were reversed for testing purposes; significant at level * $p < 0.05$; ** $p < 0.01$. BIA = brief intellectual ability; Gf = fluid intelligence; Gwm = short-term working memory.

Table 3. Correlation matrix between POD questionnaire items and WJ IV COG battery tests

POD questionnaire items	WJ IV COG tests									
	T01	T02	T03	T05	T06	T07	T09	T10	T11	T17
item 1	0.06	0.05	0.03	-0.02	-0.02	-0.095*	0.03	-0.01	0.08	-0.143**
item 2	-0.03	-0.127**	-0.08	0.02	-0.086*	-0.07	-0.06	-0.087*	-0.04	-0.03
item 3	-0.02	-0.03	0.00	-0.08	-0.07	0.02	-0.114*	-0.114*	0.07	0.119*
item 4	-0.03	-0.02	-0.04	-0.02	-0.03	0.02	-0.06	-0.03	-0.05	-0.04
item 5	-0.096*	-0.094*	-0.01	-0.06	-0.130**	-0.06	-0.093*	-0.145**	-0.03	-0.095*
item 6	0.04	-0.05	-0.03	-0.04	-0.01	-0.03	-0.08	-0.05	0.04	0.06
item 7	0.07	0.03	0.03	-0.03	0.02	-0.05	0.01	-0.07	0.03	0.07
item 8	-0.06	-0.05	0.00	-0.01	-0.01	-0.02	-0.134**	-0.05	-0.05	0.02
item 9	-0.02	-0.02	-0.01	-0.05	-0.02	-0.099*	-0.05	-0.02	0.04	0.06
item 10	-0.04	0.02	0.01	-0.07	0.05	-0.01	-0.07	-0.02	0.01	0.04
item 11	-0.155**	-0.114*	-0.091*	-0.05	-0.105*	-0.07	-0.111*	-0.153**	-0.105*	-0.05
item 12	-0.01	-0.06	-0.02	-0.092*	-0.04	-0.07	-0.07	-0.08	0.03	0.08
item 13	0.03	-0.01	0.03	-0.086*	0.03	-0.06	-0.01	-0.03	-0.06	-0.02
item 14	-0.02	-0.03	-0.06	-0.02	-0.096*	0.01	-0.03	-0.095*	0.01	0.03
item 15	0.04	-0.02	-0.02	0.01	0.02	-0.08	-0.07	-0.02	0.04	0.04
item 16	-0.233**	-0.107*	-0.186**	-0.101*	-0.219**	-0.07	-0.136**	-0.155**	-0.086*	-0.07
item 17	-0.091*	-0.07	-0.06	-0.06	-0.105*	-0.04	0.01	-0.03	0.06	0.05
item 18	-0.08	-0.03	-0.04	-0.04	-0.08	-0.088*	-0.101*	-0.087*	0.06	0.00
item 19	-0.03	-0.07	-0.094*	0.01	-0.05	-0.03	-0.095*	-0.09	0.00	0.02
item 20	-0.01	-0.05	-0.01	-0.125**	-0.04	-0.08	-0.02	-0.118*	-0.01	0.06

Significant at level * $p < 0.05$; ** $p < 0.01$; T1 = Vocabulary; T2 = Numbers; T3 = Verbal attention; T5 = Phonological processing.

Discussion

Sociocultural factors affecting performance in tests of cognitive abilities are a complex topic studied in the context of education (Hessels and Hamers, 1993) or economic situation (Dixson et al., 2016). Research on Roma children shows lower results across various cognitive tests (Dinnel et al., 1998). The current project shows such results, as we found a connection between the housing situation (overcrowding) and worse outcomes in the WJ IV COG tests with the POD questionnaire. Therefore, using this questionnaire focused on a pedagogical perspective is beneficial for a closer prediction of the possible Roma clients' need for social work and can be used in practice to identify the client's situation and speed up further processes and questioning. However, it does not provide a more detailed individual components' factor structure (social and cultural capital and other areas), which would bring about its better use in identifying individual partial influences on the development of cognitive abilities.

The POD questionnaire results, individual test results and the total cognitive scores reached low correlation coefficients, which confirms the assumption of multifactorial influences on the investigated cognitive abilities. The results focus more intensely on items that could be crucial in further research – language skills and social schemes knowledge when dealing with major institutions. These findings are suitable for further use in adapting tests to the Czech environment.

Daniele (2021) studied the link between poverty and academic skills and found that poverty affects students' mathematical abilities in Italy and Spain. He did not show the effect of residence and background on academic skills, as was shown in our case.

Studies on social minorities' intelligence testing in different countries show a substantial influence of other factors such as socially disadvantaged environments, overcrowded housing, or low cognitive stimulation environments (Rushton et al., 2007). People living in social exclusion form few social networks and interact primarily with the socially excluded (Toušek, 2007). High-quality social networks can contribute to the development of cognitive abilities (Wascher et al., 2018). Meanwhile, according to Sharifian et al. (2019), networks with more social contacts are associated with better cognitive abilities.

Several studies deal with the influence of parents' cultural background on their children's cognitive abilities and possibly the subsequent school success. Parental education positively correlates with both factors and represents the most fundamental influence of the family's cultural background (Jæger and Holm, 2003). Some studies point to the importance of the influence of the parents' education (De Graaf et al., 2000; Sullivan, 2008), and Maunah (2020) mentions only the fathers' education. Barone (2006) states that cultural background is always combined with the family's socio-economic status and aspirations.

Parental involvement in education is associated with positive outcomes in children's academic and cognitive outcomes

in elementary and secondary school (Arnold et al., 2008). Participation in educational activities can include help with homework, learning and a stimulating home environment, and parental participation in school events or meetings (Hill and Tyson, 2009). Studies on African American children (e.g., Banerjee et al., 2011) have shown the influence of parental involvement in education on better academic results, especially reading.

International research provides more detailed results regarding the influence of the socioeconomic situation (Peng and Kievit, 2020), but exclusion is not a universal phenomenon, and individual conditions differ at the national level. The Roma minority is affected by multidimensional factors of exclusion specific to the Czech environment. More detailed research on this topic is conditioned by the adaptation of a multifaceted questionnaire, which would affect several components of exclusion and be able to measure critical issues on the exclusion of the Roma minority in the Czech Republic. It is appropriate to combine a multidisciplinary perspective, which, apart from education, includes the needs for social work services.

Possible limitations of our research are that Roman parents might find it difficult to comprehend (some) items in the Social Exclusion Scale questionnaire.

Conclusions

Our research shows a connection between social exclusion (based on the perspective of the POD questionnaire) and Roma children's cognitive abilities in the Czech Republic. The detected degree of the relationship between these factors is low, but the results indicate the interconnectedness of social exclusion as an essential component in developing cognitive abilities. More detailed analyses identified sub-items of the POD questionnaire with the strongest association with WJ IV COG scores. These are primarily insufficient language, and related communication skills in administration, schools, and other institutions. Other essential factors are cultural specificities and differences. These findings can help in further research and creating an instrument covering all critical components of exclusion significant in the Czech context. For practical social work, it seems crucial to develop knowledge of the Czech language among Roma families and help with incomprehensible communication with the authorities.

Funding

The paper is a partial output of the TAČR project TL2000187-Standardization of the WJ IV (Woodcock-Johnson IV) for the population of Romani children, which focuses on the reliability of this instrument in diagnosing the target group.

Ethical aspects and conflict of interests

The authors have no conflict of interests to declare.

Vliv sociálního vyloučení na kognitivní schopnosti romských dětí

Souhrn

Cílem článku je analyzovat souvislost mezi faktory sociálního vyloučení a kognitivním rozvojem u romských dětí.

Metodika: Výzkumný soubor představovalo 400 romských dětí (etnicita na základě sebeidentifikace) vybraných kvótním výběrem ze všech krajů České republiky ze sociálně vyloučených lokalit i mimo ně, a to ve věku 7–11 let, a dále pak jejich rodičů. Jako výzkumný nástroj měřící kognitivní schopnosti byla použita baterie komplexního inteligenčního testu Woodcock–Johnson IV COG. Sociální exkluzi jsme měřili nově vytvořeným testem Škála sociálního vyloučení. Data byla zpracována pomocí korelací a regresní analýzy v programu SPSS.

Výsledky: Výzkum ukazuje souvislost mezi sociálním vyloučením a kognitivními schopnostmi romských dětí v České republice, které ale nejsou příliš korelačně silné. Jedná se především o nedostatečné jazykové znalosti a s nimi související dorozumivací schopnosti na úřadech, ve škole a dalších institucích. Dalším významným faktorem jsou pak kulturní specifika a odlišnosti romské minority. Pro praktickou sociální práci se jeví jako stěžejní pracovat na rozvoji znalosti českého jazyka u romských rodin a pomoci s nesrozumitelnou komunikací s úřady.

Klíčová slova: kognitivní schopnosti; romské děti; sociálně vyloučená lokalita; sociální vyloučení; vzdělávání; Woodcock–Johnson IV COG

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