IMPACT OF TRANSPORT DISADVANTAGE ON EDUCATION OF HIGH SCHOOL POPULATION OF THE CITY OF ZAGREB

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Abstract: Today, transport disadvantage is very outspread phenomenon which can influence individual's need and opportunities. According to scientific literature, youth are often considered transport disadvantaged part of the society. Their dependance on other people in the aspect of transportation greatly influence their everyday life. In many ways crucial segment of youth's life is education. The aim of this paper is to investigate the influence of transport disadvantage on some segments of education of high school population of the City of Zagreb. The population of interest comprised 826 high school students of high schools in the City of Zagreb. The research was based on travel time, due to the fact that transport disadvantage is a function of accessibility and mobility. Students' attitudes regarding the influence of transportation on education, as well as the correlation between travel time and academic achievement or the pupils' absence from the school, respectively, were investigated in this paper. Research was conducted and analysed using quantitative, as well as qualitative methods. Data were obtained through questionnaire survey and analysed via regression and correlation methods. In order to deepen the research of the specific problems in high school population, additional research was performed in eight focus groups of high school students of the City of Zagreb. Data analysis showed significant correlation between travel time and academic achievements of pupils, as well as correlation between travel time and absence from the school. It was also found that travel time negatively affected attitude of pupils regarding the influence of transportation on their education. These results are strongly supported by states collected through focus group research.

Keywords: transport disadvantage, high school population, travel time, education, City of Zagreb

1. Introduction

One of the objectives of any country's social policy should be ensuring "social equity". This implies enabling people to perform various life functions and to participate in various life activities, in order to avoid their exclusion. Transport plays a fundamental role in achieving social equity (Minogue, 1998; Foley, 2004). Transport is considered to be one of the fundamental factors in human life, which impacts access to life functions and their successful performance. Within transport, two elements have a critical role: mobility and accessibility. These form the fundamental requirements of today's globalised society (Hoyle and Knowles, 1998). In certain situations, mobility and accessibility can be hindered, limited or even impossible, and as such this jeopardises the use of transport services, and with that the fulfilment of daily needs. If individuals or entire social groups find themselves in such a situation, they will be exposed to the process of transport disadvantage (Gašparović and Jakovčić, 2014). In today's society, automobiles are considered the main means of transport. As such, automobiles are also an important factor that influences the definition of transport disadvantage for people. Not having, or not being able to drive a car (due to legal or other restrictions) is often listed as the main factor leading to transport disadvantage (Murray and Davis, 2001; Clifton and Lucas, 2004). Furthermore, other factors are considered to be the person's financial standing, and physical characteristics (such as gender or disability). In line with this, certain authors have defined a range of groups they deem to be at a transport disadvantage. One of these groups is children and youth (e.g., Murray and Davis, 2001; Stanley and Stanley, 2004; Dodson, et al., 2004; Hurni, 2006; Hurni, 2007). Though some authors list children and youth as a transport disadvantaged social group, it should be noted that not all age groups of youth are equally exposed to the issue of transport disadvantage. High school pupils from the ages of 15 to 18 years are considered the most exposed. Small children and primary school aged children have a lesser need for mobility than high school pupils. High school pupils are almost always required to travel a greater distance to their schools and extracurricular activities, and the locations where they spend their leisure time (i.e. evening outings) than younger children (Hopkins, 2010; Horton, et al., 2011). For that reason, the social group considered in this paper is the group of high school pupils.

School and extracurricular activities represent a crucially important segment in the life of young people in many aspects (attainment of knowledge, socialisation, identity building, etc.) (Hopkins, 2010). The issue of travelling to school is relatively poorly covered in the scientific literature, since the majority of papers examine the topic of travelling to work (van Goeverden and de Boer, 2013). High school pupils travel to work every day, and this therefore poses the question of whether transport impacts the pupil's school activities and, if yes, how it does do. Therefore, the objective of this paper was to determine the influence of transport disadvantage on educational activities of high school pupils in the City of Zagreb. Since transport disadvantage is a function of mobility and accessibility, the focus of the study was placed on determining the influence of time distance on pupil's academic success and on missing classes. In order to further corroborate the results, this paper also provides the views of high school pupils concerning the influence of transport on their school activities.

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2. Theoretical framework and research methodology

Considering their inability to drive an automobile, high school pupils will largely have limited mobility and accessibility to certain activities, since they will depend on transport from other persons (e.g. parents, friends...), the use of public transport, or walking or cycling. High school pupils will particularly be affected by the restricted participation in educational activities. High school pupils living at the city periphery or in rural areas will be most affected by the issue of accessibility. Considering that high schools are most often situated near the city centre, this problem may arise due to the distance of the pupil's home from the town centre, and with that the associated travel time and travel costs will be increased. These issues may also reflect on the pupil's academic success. Academic success is an important factor in the life of every pupil, as it forms the precondition for future educational and professional success, and of life overall (Babarović, et al., 2010). Academic success depends on a series of factors, such as cognitive capacities, the personality of the individual and environmental factors (e.g. socioeconomic status of the family, properties of the teaching process, teachers and the school the pupil attends) (Babarović, et al., 2010; Maras and Rodek, 2012). The factor of the school the pupil attends will impact academic success based the location of the school, i.e. the distance of the school from the pupil's home. This influence is often negative. Lin et al. (2013) determined that the distance from the school impacts the academic success of the pupil, as those living further from schools have poorer academic success than those pupils living near the school. The same conclusion was reached by Kamaruddin et al. (2009) and Raychaudhuri et al. (2010). Differences in academic success can also appear between pupils living in the city and those living in rural areas (Owoeye and Yara, 2011) due to the greater distances the pupils from rural areas must travel to school. Also, a greater distance to school can also lead to a lower share of youth taking part in secondary education (i.e., for the United Kingdom, see SEU, 2003; for Australia, see Currie, 2007). Furthermore, the selection of high schools to attend also in part depends on the level of transport services, i.e. the distance to the school. In some countries, a difference is seen in the percentage of pupils attending high school between those youth living at the city periphery and those living near the city centre. Time spent travelling to school can also impact the time available for studying and free time, in the sense that pupils living far from school will have less time to study and less free time than those pupils who spend little time travelling to and from school. The level of services of public transport is often significantly lower in the city periphery than in parts of the city nearer the centre (lower frequency of vehicles, poorer organisation of transport lines, etc.) (Gašparović, 2014). Youth living at the city periphery or outside the city (particularly in more remote rural areas), due to the distance to be crossed and the poorly developed transport services, will have fewer opportunities for participating in extracurricular activities, such as foreign language classes or other extracurricular education activities. With that, these youth may not have these additional education opportunities.

This paper is based on the methods of surveying and interviewing. A survey was conducted in seven high schools in the City of Zagreb in April 2013. A total of 1053 pupils were interviewed, which is just over 3% of the total number of high school pupils of the City of Zagreb in the 2012/2013 academic year (30,970 pupils[2]). After processing the questionnaires, 826 pupils remained (only those pupils having permanent residence in the boundaries of the City of Zagreb and pupils without a driver's licence were included). The questionnaire provided general information on the participants (including their academic success, number of absences from class, and means of travel to school) and the opinions and stance of pupils regarding the accessibility of school activities, and any problems that they might meet regarding the accessibility of those activities. With respect to gender, 429 female (51.9%) and 397 male (48.1%) pupils participated in the survey.

In order to obtain more in-depth information on the issue of transport disadvantage among the high school population, this study also included conducting interviews with focus groups. The focus group research was conducted in December 2013 and January 2014 in two high schools in the City of Zagreb. Pupils in each school were divided into four groups based on their age and gender. Group I was made up of female pupils in years 1 and 2, Group II of male pupils in years 1 and 2, Group III of female pupils in years 3 and 4, and Group IV of male pupils in years 3 and 4. As such, the interviews were held with these eight focus groups (four groups per school). Within each group, the dichotomy of pupils based on their place of residence was pronounced (half of pupils living near the city centre and half living nearer the city periphery). Each group was comprised of between 8 and 10 pupils.

[2] Based on the data of the City Office for Education, Culture and Sport of the City of Zagreb.

In conducting the research, the *Code of Ethics of Research with Children* (2003) was fully abided by, and guided by the idea that ethic issues are an exceptionally important segment in the planning and execution of research, particularly when youth are included in the research (Cohen, et al., 2007). A permit for the research was obtained from the Ministry of Science, Education and Sport of the Republic of Croatia and the principal of each school. Consent for interviewing pupils within the focus groups was also provided by the pupils' parents. The survey questionnaire was anonymous and completely voluntary.

In this paper, sections of the questionnaire and interviews conducted in the focus groups relating to the evaluation of the influence of transport problems on school activities and the difficulties pupils face in trying to resolve these problems. The data collected in the survey were processed using the software package SPSS Statistics 20.0 using the statistical correlation method (Pearson and Spearman correlation coefficient) and regression analysis.

The segment of researching the influence of transport on pupils' academic success and absence from classes was carried out on the pupils of years 2, 3 and 4, with a total of 640 pupils included in the analysis. The reason for this is the fact that the analysis was conducting on the pupil's academic success and absences from class achieved in the previous academic year.[3] Therefore, pupils in year 1 (186 pupils) were excluded from this analysis considering that they attended primary school in the previous year. Primary schools are located in such a way that pupils are required to travel a much lesser distance to school. A large portion of primary school pupils travel to school on their own on foot, and therefore do have absences from class due to transport.

3. Influence of transport on the school activities of high school pupils

The selection of the means of travelling to school will depend on many factors, though primarily on the distance between the pupil's home and the school (van Goeverden and de Boer, 2013). In the City of Zagreb, high school pupils most often use public transport (90.8%) or they walk or cycle to school (8.6%), while only 0.6% of pupils are driven to school by someone (Gašparović, 2014). The problems facing pupils in their travels to school are primarily dependent on the means of travel to school, and this will ultimately depend on a series of other different factors (e.g. congestion, frequency of public transport, etc.).

Transport, as the link between the place of origin and the destination, will be the key factor connecting the two components of accessibility. Therefore, the goal was to determine the extent to which transport impacts the school activities of pupils, and to that aim, the pupil's opinions on that issue were examined. Almost two-thirds (65.3%) of the high school pupils in the City of Zagreb believe that transport affects their school activities (Table 1). However, transport was found to relatively rarely influence school activities, considering that 82.2% of high school pupils stated that transport only rarely or occasionally impacts their school activities, with a weak to moderate influence. Just under one-fifth (17.8%) of pupils claim that transport has a more frequent effect (often or almost always) on their school activities, with a high to very high influence.

Table 1
Frequency and strength of the influence of transport on the school activities of high school pupils in the City of Zagreb

FREQUENCY/STRENGTH OF THE INFLUENCE	NUMBER OF PUPILS	SHARE (in %)
INFLUENCE	539	65.3
rare / poor	*186*	*34.5*
occasionally / moderate	*257*	*47.7*
often / high	*80*	*14.8*
almost always / very high	*16*	*3.0*
NO INFLUENCE	287	34.7
TOTAL	**826**	**100**

Source: survey questionnaire, 2013

[3] Academic success from the previous academic year is used in research by, for example, Vranković et al., 2011.

In line with the influence of distance from activities on the daily life of individuals, there also arose the need to investigate the influence of the travel time to school on the stance of the pupil on the influence of transport on their school activities. The results obtained indicate an association between the time of travel to school and the stance of the pupil on the influence of transport on their school activities. It was observed that the stance of pupils on the frequency of influence of transport on the daily life increased with the time necessary for travel to school. An analysis was conducted only on those pupils who expressed the attitude that transport impacts their school activities. The results indicate a slight though statistically significant association between the attitudes on the influence of transport on school activities and the travel of time to school ($\rho = 0.324$; $p < 0.01$).[4] Pupils who spend more time travelling to school believe that transport more often influence their school activities than those pupils who spend less time travelling to school. This justifies the assumption that distance from activities negatively impacts the daily life of individuals, and that pupils who travel longer to school have greater problems with their school activities than those pupils who live near to school. The ways that transport impacts school activities varies, and certain factors are more prominent (Table 2).

Table 2
Ways in which transport impacts the school activities of pupils

WAY OF INFLUENCE	NUMBER OF PUPILS	SHARE (in %)
ABSENCES FROM CLASS	230	42.7
LOSS OF TIME	146	27.0
TRAFFIC CONGESTION	55	10.2
FREQUENCY OF PUBLIC TRANSPORT LINES	54	10.0
WEATHER CONDITIONS (winter)	32	5.9
DISTANCE	8	1.5
EFFECTS ON FATIGUE AND CONCENTRATION	8	1.5
CROWDS IN PUBLIC TRANSPORT VEHICLES	3	0.6
ASSISTANCE IN LEARNING	3	0.6
TOTAL	**539**	**100**

Source: survey questionnaire, 2013

The greatest influence of transport on the school activities of pupils is seen in absences (42.7%). The reasons for these absences may vary, though pupils most often expressed traffic congestion and the frequency of public transport lines as the main reasons.

> *Traffic congestion is a problem on the way to school, and then I am late. It is a bigger problem when school is in session in the morning.*
> [Where is the traffic the worst?]
> *On Ljubljanska* (Zagrebačka Avenue) *between Getro and Remiza.*
> (male pupil, 16 years, Rudeš)

For pupils a general problem is the loss of time due to travel (27.0%). Pupils believe that this loss of time is translated into reduced time for learning or rest, and also to increased fatigue and reduced concentration in class (8%).

> *When I have school in the morning, and when I come home, if school is finished at 2 pm, I get home at 3 pm, I need to do some homework, and I can't, I eat something and I'm dead tired, I have to nap for at least two hours, so I'm tired. Then sometimes I study until 1 or 2 in the morning, and I could be done earlier if I was closer.*
> (female pupil, 15 years, Savica)

Traffic congestion is a generator of many problems, and pupils also take this factor into consideration in assessing the impacts on school activities (10.2%) and often independently stress this as a problem. The consequence of traffic jams will be fully associated with the above stated influences: tardiness and additional loss of time due to travel.

[4] Variables relating to the assessment of the frequency of influence of transport on specific activities are coded as follows: 1 – No influence; 2 – Poor influence / rarely influences; 3 – Moderate influence / occasionally influences; 4 – High influence / often influences; 5 – Very high influence / almost always influences

It affects me because I have to catch an earlier bus. For example, when I have school in the morning, then I leave at 6:45 am instead of 7:15 am, as the traffic is heavy and I am constantly looking at my watch to see if I will make it on time. This way I arrive earlier and have time for a coffee and I know I will make it to school. But that's why I have to leave home earlier.
[Are you often late if you take the 7:15 am bus?]
Yes, often.
(female pupil, 15 years, Miroševec)

The frequency of public transport lines is a problem that some pupils face (10.0%). The sparse frequency of lines, above all bus lines, can affect the organisation of travel to school or can result in tardiness.

My bus only runs every half hour and I get to school at 7:40 am and I don't know what to do. The next bus would have me arrive at 8:05 am and then I would be late. The buses should run more often.
[Where do you live in Zagreb?]
I live in Šestine.
[And what is the situation when you have school in the afternoon?]
When I have school until 8 pm, I don't get home until 9 pm because there is no bus.
(female pupil, 16 years, Šestine)

Transport will depend, to a certain extent, on weather conditions, and therefore for some pupils, that factor will affect their school activities (5.9%). This primarily refers to unfavourable weather conditions that are typical during the winter months, when snow often hinders normal traffic flow. However, rain is also known to slow traffic throughout the city, and therefore rain and slow can cause traffic congestion that then influences traffic flow and, as a result, can lead to possible tardiness of pupils to school.

If it is snowing, then I have problems getting to school because I live in Šestine.
[Do you think you would have better grades?]
No, my grades wouldn't be better, but I would be late less often. I will soon be getting my driver's licence, so then I will drive to school and I won't be late anymore.
[Do your teachers accept this as a reason for being absent?]
The teachers don't really accept this, and I have had a few unjustified absences due to transport.
(male pupil, 18 years, Šestine)

The spatial distance from the public transport stops or the general spatial distance of the pupil's residence from the school is another reason listed by pupils as having an effect on school activities (1.5%). Though overcoming the spatial distances will depend, among other things, on the mode of transport selected by the pupils, its efficacy and other factors previously discussed, this variable will still have a significant influence on the travels of certain pupils to school.

Another way it impacts me is that I have to walk about twenty minutes to the tram stop, then take the tramway, and then walk further to school. And I never know when the tram is going to come, so I always leave earlier and then I arrive at school earlier.
[How long does it take you to get to school?]
An hour.
(female pupil, 15 years, Remetinec)

Congestion as a factor affecting certain activities need not only be viewed as traffic congestion (0.6%). This variable may also reflect the capacity of transport vehicles in public transport, which ultimately can result in not boarding a vehicle and waiting for the next, and in tardiness to school.

I travel from Dubrava and I don't think that (transport) *strongly affects grades, instead it has a greater impact on arriving at school, since the morning crowds on the tram are huge, and sometimes I can't even board, and then I have to walk 15 minutes to the final station. In doing so, I waste time and then am late for school.*
(male pupil, 18 years, Dubrava)

To this point, these were primarily comments on the negative impacts of transport on pupils' school activities. However, the time spent in public transport while travelling to school is used by some pupils for studying or reviewing learning materials (0.6%).

I study in the tram and bus.
(male pupil, 18 years, Jarun)

Considering that academic success depends on a series of factors, in this analysis, the variable of academic success has been attempted to be placed in a mutual relationship with the available data from the survey questionnaire (Table 3). For that purpose, the following predictors were used: pupil gender, pupil age, time spent weekly on studying, motivation, importance that good grades has in the pupil's life, assessed time of travel to school and means of travelling to school.[5] The influence of transport on academic success was expressed using a regression analysis. Prior to doing so, it is worthwhile determining whether there is an association between the previously listed predictors and the dependent variables, in this case, the grade point average. For the analysis, the possible association between travel time and the use of public transport with academic success will be of crucial importance.

Table 3
Association of certain predictor variables with academic success

PREDICTORS	**r**	**p**
AGE	.064	.064
GENDER	.221**	.000
TIME SPENT STUDYING	.219**	.000
TRAVEL TIME	-.139**	.000
ABSENCES DUE TO TRANSPORT	-.136**	.000
PUBLIC TRANSPORT	-.092*	.020
	ρ	**p**
SIGNIFICANCE OF ACADEMIC SUCCESS	.294**	.000

r = Pearson's correlation coefficient
ρ = Spearman's rank correlation coefficient
p = likelihood of the random appearance of the value
* value is statistically significant at a risk level of 5% ($p < 0.05$)
** value is statistically significant at a risk level of 1% ($p < 0.01$)
Source: survey questionnaire, 2013

The results obtained indicated the assumption of the presence of an effect of distance of the pupil's home from the school on academic success, measured in travel time. Namely, there is a statistically significant correlation ($r = -0.139$; $p < 0.01$) between these variables. The correlation is negative, indicating that pupils who travel longer to school may have poorer academic success. Though this correlation may fall under the category of negligible associations, it systematically arises, and as such may indicate a problem of the influence of traffic or transport disadvantage on the academic success of certain pupils.

Further, the analysis indicates that some pupils who use public transport to get to school have poorer academic success than other pupils. However, this correlation is even weaker than the previous one ($r = -0.092$; $p < 0.05$) and may also fall under the category of negligible association, though one cannot ignore the fact that it arises regularly. This correlation can be justified with the fact that pupils who take public transport to school also live further away, and as a rule spend more time on travel than pupils who walk, cycle or are driven to school. The negative statistically significant correlation with academic success is also shown for the total number of classes missed due to transport ($r = -0.136$; $p < 0.01$). This will be discussed in greater detail further in the section on the influence of transport on missed classes.

After establishing a correlation between the dependent variables and predictors, the regression analysis was conducted to determine in detail the influence of individual (independent) variables on academic success as the dependent variable (Table 4). Backward stepwise regression was employed.

[5] For the predictor "means of travel to school", only the results for pupils who travel to school using public transport will be used. The reason is that the regression analysis is used to analysis this issue, which does not tolerate a small sample, and since 55 pupils of years 2, 3 and 4 walk to school, 4 are driven by car, and 1 pupil drives a moped, this small number is not suitable for the regression analysis.

Table 4
Standardised beta-coefficients of variables that provide to be significant predictors of the effect on academic success in the regression analysis performed using backward stepwise regression.

PREDICTORS	β	R	R^2	R^2-corrected
AGE	0.096			
GENDER	0.134			
TIME SPENT STUDYING	0.146	0.398	0.158	0.150
IMPORTANCE OF ACADEMIC SUCCESS	0.238			
TRAVEL TIME	-0.083			
ABSENCE FROM CLASSES DUE TO TRANSPORT	-0.067			

β = standardised regression coefficient
R = coefficient of the multiple correlation
R^2 = coefficient of the multiple determination
R^2-corrected = corrected coefficient of the multiple determination
Source: survey questionnaire, 2013

The results indicate that the predictors explained 15.0% of the variance of the academic success (R = 0.398; R^2-corrected = 0.150). The largest share of the regression analysis was explained by motivation, i.e. the importance of achieving better academic success. The travel time to school had a negative β coefficient, i.e. was negatively correlated with the criterion. This indicates that individuals spending more time on travelling to school have poorer academic success. Also, the predictor relating to absences due to transport also had a negative β coefficient, indicating that individuals with more absences due to transport had poorer academic success.

It should certainly be noted that the regression analysis included variables that were available for testing via the survey questionnaire. Due to the anonymity of the survey, sensitive personal questions and respecting the privacy of high school pupils (which are still mostly minors), and the social status of pupils (family's financial situation, parent's education status, number of family members, number of automobiles in the family, etc.) were not tested. It is very likely that these factors largely impact the academic success of pupils, and as such would likely change the relations in the regression analysis. These facts certainly open the possibility for further research on the issues of the impacts of transport and transport disadvantage on the academic activities and academic success of pupils.

Mastering skills and attaining competencies will certain largely depend on the pupil's attendance of classes. Furthermore, attendance of classes will also impact academic success. Frequent absences from classes disturb the continuity of learning and will certainly reflect on the pupil's work (Markuš, 2009). The emphasis in research is placed on the total number of classes missed due to transport, as it is assumed that each class missed is harmful for the pupil's education process, regardless of whether these are justified or unjustified absences.

The influence of transport on absences from school is primarily visible in pupils who spend more time travelling to school. Namely, the correlation between the number of absences from classes due to transport and the time pupils spend in travelling to school is positive and statistically significant ($r = 0.401$; $p < 0.01$). This is a correlation that has the strength of a truly significant correlation, and indicates an increased number of absences from schools with increasing time spent travelling to school. Therefore, it is possible that pupils who travel longer to school will have more absences from class, which is expected. However, these absences will have a consequence on the education process of pupils, who will not have the same learning conditions as pupils who have been absent from class significantly less due to transport. Such a situation can also be seen in the pupil's academic success, which was tested statistically. In line with this, a slightly negative correlation was seen between the variables absences from class due to transport and academic success, though it should be emphasised that the correlation is statistically significant and appears systematically ($r = -0.136$; $p < 0.01$). This indicates the possible negative impact of absences due to transport, i.e. the situation that academic success is reduced due to an increasing number of absences due to transport. It is necessary to consider that absences for other reasons, and not only transport, will also affect academic success, though these data were not available for the purposes of this study.

The previously stated result indicates that academic success may be dependant, to a certain extent, on transport. A difference will certainly be seen between pupils who travel further to school and pupils who arrive at school quickly. Pupils requiring longer to travel to school will, to a certain extent, indicate the issue of the influence of transport on their grades and academic success. These are pupils who live in parts of the city near the periphery, and who need 60 to 90 minutes for the one-way trip to school, meaning that they spend approximately the same amount of time returning. These pupils will also most often mention traffic congestion or the sparse frequency of public transit lines as the main reason for the long trip to school. It should be noted that there were no significant differences found between males and females in this segment of the research.

I live in Trnava, and my bus often runs irregularly. When I get to Kvaternik square, the bus there runs regularly, so I have to leave much earlier because I never know when I will arrive.
[Do you believe that transport affects your learning and your grades?]
I think it does in comparison to those who live closer, they always have time for everything, and we are always tight with time, we have to leave earlier to get to school, meaning we have to wake up earlier.
[How do you try to resolve that problem?]
Because I spend more time travelling, then I study at night and I study in the bus, because I travel for half an hour from Trnava to Kvaternik square.
(female pupil, 18 years, Trnava)

I travel an hour and a half to school from Kraljevečki Novaki and yes, I think it does impact my school and I think I would certainly have better grades if I lived closer.
[How do you explain that?]
I don't have time to do my homework. When I have school in the morning, I have to catch the bus at 6:10 am, and I have to get up at about 5 am. The bus does not run often, only every half hour.
(female pupil, 17 years, Kraljevečki Novaki)

I think that the main problem in the influence of transport on school is the lost time for studying.
[Where do you travel from and how long does it take you to get to school?]
I live in Stenjevec and it takes me an hour and 20 minutes to get to school, especially in the morning because of the congestion on Bologna Avenue, and I also have to walk 10 minutes to get to the bus. If I travelled by car I would certainly arrive faster, because I wouldn't have to walk to the bus, wait for the bus, then the tram, and then walk to school.
[Do you think this affects your grades?]
I think that I have less concentration because I'm tired, and because of that lower grades.
(male pupil, 19 years, Gajnice)

Travel is not so important, but it does have some influence. Not like I'm about to fail the academic year, but there are some nuances of influence.
(male pupil, 16 years, Borovje-Žitnjak)

Pupils living relatively near their school, particularly if they are able to walk and therefore do not need much travel time, claim there is no influence of travel or distance, or transport, on academic success. Such an attitude should not be surprising, since these pupils travel to school about ten minutes on foot, which leaves more time for studying and doing homework, and for rest. Again, there were no differences in the attitudes between male and female pupils.

[How do you travel to school?]
I walk to school.
[Do you think that this affects your grades?]
No, I don't think it does at all.
(female pupil, 16 years, Kozjak)

[How long does it take you to travel to school?]
It takes me about 15 minutes on the bus from Remete.
[Do you think that impacts your school activities?]
I don't think it does.
(male pupil, 18 years, Remete)

The influence of transport on school activities is also visible in the segment of lost time. This will have a direct influence on pupils who travel longer to school, and again the influence of longer travel time and frequency of public transit lines will be evident (pupils living in neighbourhoods at the periphery and who travel 60 minutes or more to school). Though some pupils believe that transport does not directly impact their academic success, this is not true, as the time lost in travel will directly affect the organisation of their daily activities. Some pupils study at night, which results in fatigue, a lack of concentration and lower grades. Both male and female pupils expressed virtually identical stances.

It (transport) *affects me quite a bit because I live in Sesvete and I have to combine bus and tram. The bus runs only every 45 minutes, and if I miss that bus, then I automatically miss the next bus at Kvaternik square and then I will likely be late for school.*
[How does the frequency of bus lines affect your school activities?]
I have to leave much earlier, [how much earlier?] *and hour and a half earlier, and today, for example, I didn't have time to learn the lessons for Croatian.*
(female pupil, 15 years, Sesvete)

I think it's a little easier for those who live closer, but we can overcome this. It's not critical, but I'm sure that there are some nuances of a difference. I don't think it will affect whether we pass with a 4 or a 5, it has a greater affect on the loss of time.
(female pupil, 16 years, Mikulići)

It takes me an hour and a half to get to school and I lose a lot of time. We probably get less sleep because of the long trip to school.
(male pupil, 16 years, Branovečina)

In addition to the assessment and time for studying, transport also affects pupils' absence from classes. The greatest problem will be for those pupils living further from school, particularly if they use public transport to get to school. No differences were observed among the sexes on this issue. A larger number of unjustified absences may lead to the passing of disciplinary measures against the pupil for the violation of their duties and non-fulfilment of their obligations. Pupils most often listed traffic congestion, crowds in the public transport vehicles and frequency of transport lines as the main reasons for being late for school.

Tardiness is a problem, because they will not justify those absences. Some class teachers will, others will not. I had one unjustified absence last year, but my friend had four because of transport. They tell us to bring a confirmation letter from ZET (''Zagreb Electric Tram'' company).
[And do you bring it?]
Who's going to go and ask for one!?
(female pupil, 15 years, Sesvete)

You can't board the bus because it's full, so you wait for the next one, and it's full too, and then you're late for school.
(male pupil, 15 years, Rudeš)

4. Conclusion

One of the major preconditions of future success on academic and professional level as well as in life are grades and academic success. It depends on a variety of objective and subjective factors. In this context, the influence of transport disadvantage is analysed in relation to academic success of pupils.

The results obtained confirmed that travel time influenced pupils' academic success. Although this relation is relatively weak, it is still statistically significant. Pupils traveling longer to school had lower grades and academic success than those who travel less. Beside, these pupils believe that transport has more impact on their school activities. In this group problems related to transport were being late for school, loss of time due to traveling, traffic congestion and frequency of transport lines. In addition, traveling time has impact on pupils' absence from classes. Number of pupils' absence from classes due to transport is increasing with traveling time to school. More importantly, pupils' grades and academic success are decreasing with increasing number of absence from classes due to transport.

As most of the high schools of the City of Zagreb are located in broader region of city centre, pupils living at the city periphery will travel longer to school than those living closer to city centre. In this case, pupils will be transport disadvantaged, and their dependence on public transport (which most of the pupils use for traveling to school) will become apparent. Pupils living at the city periphery have more problems related to insufficient development of public transport system and to lower frequencies of public transport compared to frequencies in city centre. These pupils have to change two or three modes of public transport in order to reach the school which often leads to being late to school because of bad connections between public transport lines used.

Logically, spaces further from city centre cannot have equal frequencies of public transport as the ones in the centre. Still, transport disadvantaged spaces need to be analysed, so more efficient organisation of public transport can be worked on in order to improve quality of life. In this way, differences in transport disadvantage could be reduced in a sense of easier accessibility to life opportunities, and transport and social equity.

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