

6 INFLUENCE OF HEALTH RISK BEHAVIOUR AND SOCIO-ECONOMIC STATUS ON HEALTH OF SLOVAK ADOLESCENTS.

ABSTRACT

The aim of this study was to investigate the role of health risk behaviour (smoking, alcohol consumption) in the explanation of socio-economic health differences among adolescents. Two hypotheses, one positing different exposure and the other different vulnerability, were explored.

Prevalence of health complaints among smokers vs. non-smokers, alcohol consumers vs. abstainers and among socio-economic groups of Slovak adolescents (n=2616, mean age 15 years) were explored.

Socio-economic disadvantage and the presence of health risk behaviour were associated with greater frequency of health complaints experienced by adolescents. Socio-economic differences unfavourable for lower socio-economic groups were found in smoking, but not in alcohol consumption. Socio-economic status and health risk behaviour interacted in their influence on health, when socio-economic status was based on the mother's characteristics. Analysis of confirmed interaction effects of socio-economic status and health risk behaviour on health revealed evidence for both our hypotheses, i.e. different exposure and different vulnerability. The evidence of different exposure seems to be stronger. Socio-economic health differences are non-significant among non-smokers and abstainers, but strongly significant among smokers and alcohol consumers. The influence of health risk behaviour on health is weaker in higher socio-economic groups.

Both hypotheses, of different exposure and of different vulnerability, seem to be valid for explanation of socio-economic health differences among Slovak adolescents.

Key-words:

smoking, alcohol consumption, socio-economic status, health, Slovak adolescents

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INTRODUCTION

While Scottish (*West 1988, West et al. 1990, MacIntyre and West 1991, Glendinning et al. 1992, Ford et al. 1994*), Finnish (*Rahkonen et al. 1995*), and Dutch (*Tuinstra 1998*) studies indicated relative equality in health among adolescents, more recent studies from Nordic countries (*Halldórsson et al. 2000*), USA (*Call and Nonemaker 2000*), and Slovakia (*Geckova et al. 2001d*) bring into the debate evidence of inequalities in health among adolescents which are unfavourable for lower socio-economic groups.

Socio-economic status (SES) influences health indirectly, through more specific determinants of health and illness (*Stronks 1997*). This hypothesis of social causation supposes that people in lower socio-economic groups live in less favourable circumstances and more frequently engage in health risk behaviour (HRB). The question is whether the uneven distribution of health determinants (hypothesis of different exposure) or differential health impact of these determinants can explain the unequal distribution of health in the population (*Ranchor 1994, Kooiker and Christiansen 1995, Stronks 1997, Tuinstra 1998, Call and Nonemaker 2000*).

According to the hypothesis of different exposure, socio-economic health differences may be explained by varying occurrence of health determinants among SES groups: Determinants of detrimental effects on health (HRB, long-term difficulties, life-events) occur more frequently, and determinants of protective effects on health (physical exercise, social support) occur less frequently in lower SES groups in comparison with higher SES groups.

The differential vulnerability model supposes that higher SES groups have some mechanism at their disposal which inhibits detrimental effects and stimulates protective effects of health determinants. Lower SES groups are less well equipped to cope with the stressors (*Stronks 1997, Tuinstra 1998*).

Kooiker and Christiansen (*1995*), Stronks et al. (*1998*), Ranchor et al. (*1996a*) explored these hypotheses in the adult population and found support for the hypothesis of different exposure, but not for the hypothesis of different vulnerability.

Call and Nonemaker (*2000*) studied the indirect and moderating effects of HRB (smoking, alcohol use, and marijuana use) on the relationship between SES and health outcomes among adolescents. The association between SES and health remained significant even when the influence of HRB was taken into account. Cigarette smoking and use of marijuana were associated with worse health, while use of alcohol was not. They did not confirm the variation in the influence of health risk behaviour on health within SES groups (*Call and Nonemaker 2000*).

Tuinstra (1998) examined whether adolescents in the lower SES group were more vulnerable to the negative consequences of maladaptive decision-making styles in comparison with adolescents in the higher SES groups, in terms of HRB. The hypothesis of different vulnerability was however not confirmed.

The present paper attempts to contribute to the explanation of socio-economic health differences among adolescents. In previous papers we confirmed socio-economic differences in both health and HRB among Slovak adolescents (Geckova et al. 2001d, Geckova et al. 2001e) and also the detrimental effect of HRB on the health of adolescents (Geckova et al. 2000b). Our attention has now shifted from description towards explanation of socio-economic health differences. The influence of HRB and SES on health will be explored with the aim of testing the hypothesis of different exposure and the hypothesis of different vulnerability. Significant socio-economic differences in both health and HRB are unfavourable for lower SES groups, and moreover a significant detrimental effect of HRB on health would be found if the first one, the hypothesis of different exposure, were valid. In the extreme case we would find socio-economic health differences only if HRB were present. If the hypothesis of different vulnerability is valid, we should find a lower influence of HRB on health in higher SES groups and a higher influence of HRB on health in lower SES groups. In the extreme case we should find a significant detrimental influence of HRB on health in lower SES groups, but not in higher SES groups.

Gender differences in health and HRB (Geckova et al. 2001b, Geckova et al. 2001f), confirmed among Slovak adolescents, were the reasons for treating gender as a covariant. Females are characterised by poorer health but lower incidence of smoking and alcohol consumption in comparison with males.

First we ascertain whether significant socio-economic differences in health unfavourable for lower SES groups of adolescents are present, and also whether significant detrimental influences of HRB on the health of adolescents are present. Research will be based on the following questions in line with our two hypotheses:

Different exposure: Are there significant socio-economic differences in occurrence of HRB unfavourable for lower SES groups of adolescents? Are there significant differences in socio-economic health differences between adolescents reporting and not reporting HRB?

Different vulnerability: Are there significant socio-economic differences in the influence of HRB on health among SES groups of adolescents?

METHODS

PROCEDURE AND RESPONDENTS

Data were collected in 1998. The sample consisted of 2616 first year students of 31 secondary schools located in Kosice (52,4% boys, 47,6% girls, and mean age 15 years). The sample was stratified according to gender and types of secondary schools; the proportion of the five educational levels of the regular Slovak school system was maintained. Individual schools were selected at random. Our sample is representative of the Slovak adolescent population. Respondents completed the questionnaire at school, in their classrooms under the guidance of the field workers. The response rate was 96,3%; the non-response was due to sick leave and other types of school absence. The average occurrence of missing values was 2,7%. The data were obtained by means of self-reported questionnaires which included several measures of HRB, SES and health.

Measures of HRB (smoking, alcohol consumption)

Adolescents were asked how many cigarettes they smoked and how many times they had drunk alcohol during the preceding 4 weeks. Based on their answers to the first question they were divided into smokers (1 and more cigarettes per day) and non-smokers (I do not smoke) and based on their answers to the second question they were divided into consumers of alcohol (at least once during last 4 weeks) and abstainers (I did not drink during last 4 weeks).

Measures of SES

Two types of socio-economic indicators were used. The first one is based on the parents: the education of father, the education of mother, the occupational class of father, the occupational class of mother. The second one is based on the adolescents: the type of school they attend.

The adolescents reported about the level of education successfully completed by their fathers and mothers. Educational level was classified as: university (father 20,8%; mother 15,6%), secondary high school (father 36,6; mother 52,8%), vocational or primary school only (father 42,7%; mother 31,6%).

The measure of occupational class of parents is based on asking adolescents about the father's and mother's current occupation, or their last occupation if they are currently unemployed. The information obtained was transformed into 9 categories of ISCO (1992, 1993). Finally, some categories were combined.

The high SES group includes I. legislators, senior officials and managers and II. professionals (father 23,4%; mother 16,7%), the medium SES group includes III.

technicians and associate professionals, IV. Clerks and V. Service workers and shop and market sales workers (father 21,4%; mother 58,9%), and the low SES group includes VI. Skilled agricultural and fishery workers, VII. Craft and related trades workers, VIII. Plant and machine operators and assemblers and IX. Elementary occupations (father 55,2%; mother 24,4%).

Adolescents were divided according to the type of school they attended into these three groups: grammar school students (21,8%), secondary technical school students (42,4%) and apprentice school students (35,7%).

Measures of Health

Health was measured by the Slovak version of a shortened 13-item version of the VOEG (*Dirken 1967, Jansen and Sikkel 1994*). This questionnaire shows a valid and reliable picture of current health status (*Furer et al. 1995*). It expresses the following physical health complaints: stomach feels full and bloated; get short of breath easily; pain in the chest and heart region; bones and muscles ever ache; feel tired; headache; backache; upset stomach; feel dead legs; get tired sooner; feel dizzy; feel listless; get up feeling tired and unrested. We used a 5-anchor scale expressing the frequency of suffering by included health complaints during the last month in the Slovak version. A cut-off point of three times and more was used in our study for dichotomization. Adolescents mostly suffer from headache, backache and tiredness (*Geckova et al. 2001b*). We examined the sum score of the VOEG, or in other words the sum of experienced health complaints.

ANALYSIS

The analyses were done using the statistical software package SPSS, version 7.5.2. Gender was treated as a covariant, while SES and health risk behaviour were treated as independent variables (fixed factors), and the sum of health complaints was treated as continuous dependent variable. The analysis (GLM) was computed separately for each SES indicator (the education of father, the education of mother, the occupational class of father, the occupational class of mother, type of school) and HRB indicator (smoking, alcohol consumption). Logistic regression was used to explore socio-economic differences in HRB.

RESULTS

Firstly, we explored the influence of SES and the influence of HRB on health separately. Parameters are described in Table 18.

Table 18 Influence of HRB and influence of SES on health of adolescents – parameter estimates (GLM)

Explored Models	Mean sum score VOEG	Adjusted R Square	sig	B	95% Confidence Interval					
					lower	upper				
Influence of SES										
a father's education	university	2,10	0,052	0,033	-0,267	-0,514	-0,021			
	secondary	2,22						0,147	-0,361	0,054
	vocational	2,42								
b father's occup. group	high SES	2,07	0,050	0,058	-0,225	-0,458	0,008			
	medium SES	2,32						0,869	-0,260	0,220
	low SES	2,35								
c mother's education	university	2,06	0,052	0,021	-0,334	-0,618	-0,051			
	secondary	2,23						0,040	-0,423	-0,010
	vocational	2,48								
d mother's occup. group	high SES	2,11	0,048	0,016	-0,369	-0,667	-0,070			
	medium SES	2,26						0,053	-0,451	0,003
	low SES	2,51								
e type of school	grammar	2,22	0,054	0,007	-0,341	-0,588	-0,009			
	secondary	2,24						0,002	-0,532	-0,117
	apprentice	2,39								
Influence of HRB										
1 smoking	non-smokers	2,06	0,087	0,000	-1,065	-1,272	-0,859			
	smokers	2,95								
2 alcohol consump.	abstinents	1,87	0,094	0,000	-1,015	-1,195	-0,836			
	consumers	2,80								

Adolescents from lower SES groups experienced more health complaints. There are significant socio-economic health differences when father's education, mother's education, mother's occupational group and type of school are used as SES indicators. When father's occupational group alone is used as SES indicator, socio-economic health differences are not significant, and when father's education alone is used as SES indicator, socio-economic health differences are significant only between highest and lowest SES group of adolescents.

Smokers and alcohol consumers experienced significantly more health complaints. The models including SES (model a-e, see Table 18) explained about 5% of variance in health, while the models including HRB (model 1-2, see Table 18) explained about 9% of variance in health (adjusted R²).

The occurrence of smokers is higher in lower SES groups in both males and females. The occurrence of alcohol consumers in lower SES groups is higher among males, but lower among females. As can be seen in Table 19, significant socio-economic differences were confirmed in smoking, but not in alcohol

consumption. When SES is based on father's characteristics, socio-economic differences are significant only between high and low SES groups, but not between low and medium SES groups (model 1a, 1b, see Table 19).

Table 19 Socio-economic differences in HRB – parameter estimates (Logistic Regression)

Explored Models	% of smokers, consumers	Adjusted R Square	sig	B	95% Confidence Interval		
					lower	upper	
Smoking							
1a father's education	university	18,2		0,000	0,543	0,418	0,705
	secondary	26,4		0,229	0,884	0,724	1,080
	vocational	28,3	0,025	0,000			
1b father's occup. group	high SES	18,9		0,000	0,594	0,463	0,761
	medium SES	25,0		0,278	0,877	0,691	1,112
	low SES	27,5	0,024	0,000			
1c mother's education	university	20,0		0,000	0,571	0,427	0,763
	secondary	24,7		0,014	0,780	0,640	0,951
	vocational	29,2	0,022	0,001			
1d mother's occup. group	high SES	19,1		0,000	0,552	0,406	0,751
	medium SES	24,6		0,015	0,765	0,615	0,950
	low SES	29,5	0,021	0,001			
1e type of school	grammar	13,3		0,000	0,258	0,195	0,340
	secondary	20,7		0,000	0,438	0,359	0,534
	apprentice	38,8	0,063	0,000			
Alcohol consumption							
2a father's education	university	45,3		0,847	1,021	0,827	1,261
	secondary	42,2		0,489	0,939	0,786	1,122
	vocational	44,4	0,005	0,693			
2b father's occup. group	high SES	45,7		0,319	1,108	0,906	1,354
	medium SES	45,2		0,381	1,097	0,892	1,350
	low SES	42,9	0,005	0,504			
2c mother's education	university	46,1		0,453	1,097	0,861	1,397
	secondary	44,4		0,687	1,037	0,869	1,237
	vocational	43,3	0,006	0,753			
2d mother's occup. group	high SES	47,0		0,167	1,260	0,976	1,628
	medium SES	45,1		0,077	1,164	0,958	1,416
	low SES	41,2	0,007	0,127			
2e type of school	grammar	45,7		0,826	1,024	0,829	1,265
	secondary	41,8		0,133	0,731	0,731	1,042
	apprentice	46,2	0,007	0,190			

Main effect of gender on health is included into the all models. Gender is included into the all models as a covariant.

SES and gender explained about 2% of variance in smoking and about 0,6% of variance in alcohol consumption (adjusted R²). One exception is the type of school, which together with gender explains 6% of variance in smoking (model 1e, see Table 19).

With a similar aim, we explored models including the main effect of HRB and SES on health and also the interaction effect of HRB and SES on health. Parameters are described in Table 20.

The influence of HRB remained significant in all the models explored, while several SES indicators did not. The influence of father's education was not significant in either model, including smoking (model 1a*, see Table 20) and including alcohol consumption (model 2a*, see Table 20). The influence of father's occupational group and type of school was not significant in models including smoking (model 1b*, 1d*, see Table 20). Significant interaction effects between HRB and SES were confirmed in models including mother's education, mother's occupational group, smoking and alcohol consumption (model 1c*, 1d*, 2c*, 2d*, see Table 20).

The explored models explained 8-10% of variance in health status. The influence of HRB on health is stronger in comparison with the influence of SES on health (B, R square).

The influence of HRB is higher in lower SES groups of adolescents (skewness of curve). Socio-economic health differences are very low or absent in the groups of non-smokers and abstainers, but are present in the groups of smokers and alcohol consumers. This pattern, described in Figures 3-4, is only partially significant, as can be seen in Table 20. The interaction effect between abstainers and university education of mother and between abstainers and medium SES of mother is not significant.

Additional analysis confirmed this pattern. We searched for socio-economic health differences separately in the group of smokers, non-smokers, alcohol consumers and abstainers. We also explored the influence of HRB on health among SES groups of adolescents. The parameters can be seen in Table 21.

Socio-economic health differences are non-significant among non-smokers and abstainers, but strongly significant among smokers and alcohol consumers.

The influence of HRB, and of smoking in particular, is weaker (B-coefficients), or in one case (smoking when mother's occupational group is used as SES indicator) non-significant in higher SES groups.

Table 20 Influence of HRBr and SES on health of adolescents – parameter estimates (GLM)

Explored Models	Adjusted R Squared	sig	B	95% Confidence Interval		
				lower	upper	
a1*smoking non-smokers	0,086	0,000	-0,865	-1,175	-0,555	
smokers						
father's university		0,731	-0,094	-0,627	0,440	
educ. secondary		0,412	,164	-0,228	0,556	
vocational						
interact. non-smoker*university	0,750	0,079	-0,010	-0,697	0,502	
effects non-smoker*secondary			-0,412	-0,871	0,005	
b1*smoking non-smokers	0,081	0,000	-1,080	-1,364	-0,797	
smokers						
father's high SES		0,599	0,001	-0,135	-0,638	0,368
occup. medium SES		0,327	0,001	-0,234	-0,701	0,234
group low SES						
interact. non-smoker*high	0,965	0,001	0,013	-0,553	0,578	
effects non-smoker*medium	0,251	0,001	0,317	-0,225	0,859	
c1*smoking non-smokers	0,091	0,000	-1,609	-1,963	-1,255	
smokers						
mother's university		0,001	0,001	-1,601	-0,427	3,385
educ. secondary		0,000	0,001	-0,746	-1,134	-0,359
vocational						
interact. non-smoker*university	0,002	0,001	1,042	0,374	1,709	
effects non-smoker*secondary	0,001	0,001	0,791	0,337	1,246	
d1*smoking non-smokers	0,083	0,000	-1,501	-1,915	-1,088	
smokers						
mother's high SES		0,001	0,001	-1,049	-1,671	-0,427
occup. medium SES		0,006	0,001	-0,587	-1,010	-0,165
group low SES						
interact. non-smoker*high	0,004	0,001	1,043	0,336	1,751	
effects non-smoker*medium	0,023	0,001	0,578	0,080	1,076	
e1*smoking non-smokers	0,086	0,000	-1,138	-1,446	-0,829	
smokers						
type of grammar		0,386	0,001	-0,254	-0,830	0,321
school secondary		0,189	0,001	-0,258	-0,644	0,127
apprentice						
interact. non-smoker*grammar	0,489	0,001	0,226	-0,414	0,865	
effects non-smoker*secondary	0,473	0,001	0,167	-0,290	0,624	

Explored Models	Adjusted R Squared	sig	B	95% Confidence Interval					
				lower	upper				
a2* alcohol abstinent	0,095	0,000	-1,070	-1,348	-0,791				
consump. consumers									
father's university						0,079	-0,321	-0,679	0,038
education secondary						0,229	-0,188	-0,495	0,118
vocational									
interaction abstinent*university	0,745	0,080	-0,404	0,564					
effects abstinent*secondary	0,727	0,073	-0,337	0,482					
b2* alcohol abstinent	0,093	0,000	-1,079	-1,332	-0,827				
consump. consumers									
father's high SES						0,027	-0,383	-0,723	-0,043
occup. medium SES						0,795	-0,047	-0,399	0,305
group low SES									
interaction abstinent*high	0,292	0,246	-0,212	0,704					
effects abstinent*medium	0,947	0,016	-0,457	0,489					
c2* alcohol abstinent	0,098	0,000	-1,403	-1,726	-1,080				
consump. consumers									
mother's university						0,002	-0,660	-1,071	-0,249
education secondary						0,001	-0,533	-0,838	-0,228
vocational									
interaction abstinent*university	0,058	0,536	-0,019	1,091					
effects abstinent*secondary	0,010	0,534	0,128	0,940					
d2* alcohol abstinent	0,095	0,000	-1,470	-1,851	-1,089				
consump. consumers									
mother's high SES						0,000	-0,819	-1,257	-0,381
occup. medium SES						0,001	-0,562	-0,903	-0,220
group low SES									
interaction abstinent*high	0,020	0,700	0,111	1,289					
effects abstinent*medium	0,075	0,525	0,075	0,975					
e2* alcohol abstinent	0,096	0,000	-1,072	-1,372	-0,773				
consump. consumers									
type of grammar						0,018	-0,432	-0,790	-0,074
school secondary						0,039	-0,321	-0,625	-0,016
apprentice									
interaction abstinent*grammar	0,508	0,164	-0,320	0,647					
effects abstinent*secondary	0,773	0,060	-0,347	0,467					

Gender is included into the all models as a covariant

Figure 3 The interaction effect between influence of SES and smoking on health of adolescents

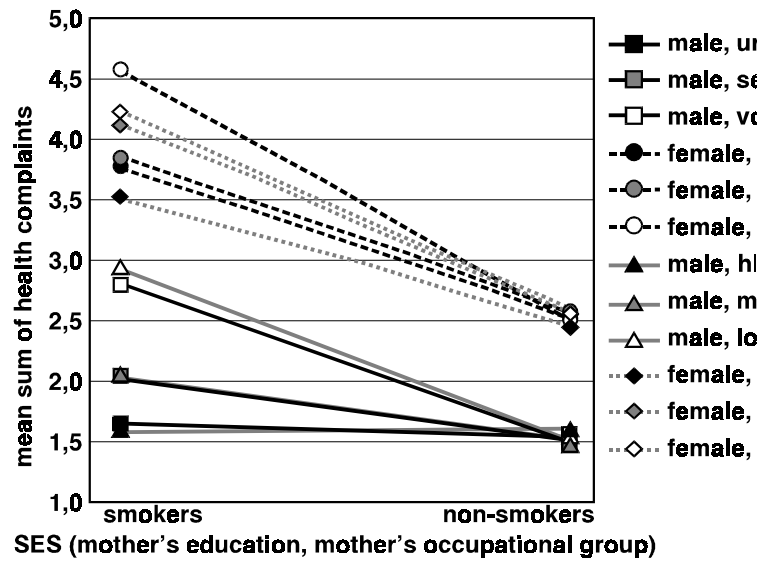


Figure 4 Interaction effect between influence of SES and alcohol consumption on health of adolescents

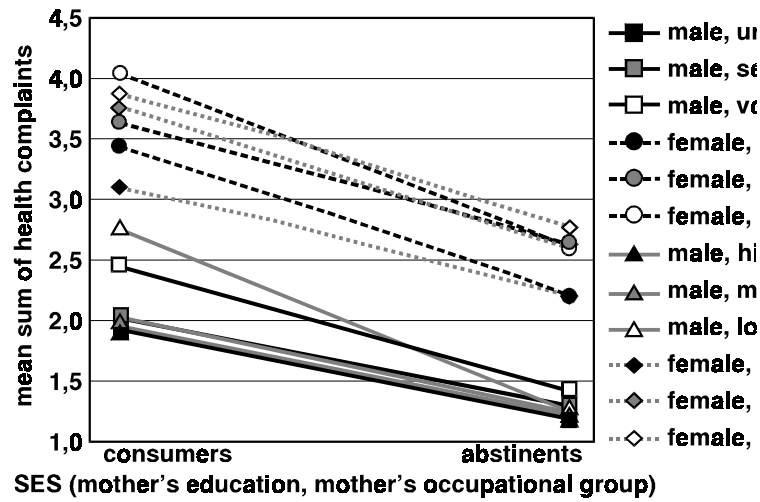


Table 21 Influence of SES and health risk behaviour on health of adolescents. Additional analysis – parameter estimates

		Adjusted R Squared	sig	B	95% Confidence Interval	
					lower	upper
HYPOTHESIS OF DIFFERENT EXPOSURE						
non-smokers						
mother's education	university	0,046	0,968	0,006	-0,298	0,310
	secondary		0,733	0,040	0,188	0,268
	vocational					
mother's occup. group	high SES	0,044	0,910	-0,019	-0,343	0,306
	medium SES		0,891	-0,018	-0,272	0,236
	low SES					
smokers						
mother's education	university	0,127	0,003	-0,981	-1,630	-0,322
	secondary		0,001	-0,712	-1,140	-0,283
	vocational					
mother's occup. group	high SES	0,114	0,002	-1,081	-1,764	-0,397
	medium SES		0,015	-0,579	-1,044	-0,115
	low SES					
abstinents						
mother's education	university	0,048	0,387	-0,151	-0,494	0,191
	secondary		0,943	-0,009	-0,255	0,237
	vocational					
mother's occup. group	high SES	0,052	0,471	-0,133	-0,493	0,228
	medium SES		0,733	-0,047	-0,315	0,222
	low SES					
alcohol consumers						
mother's education	university	0,080	0,004	-0,657	-1,107	-0,207
	secondary		0,002	-0,534	-0,868	-0,200
	vocational					
mother's occup. group	high SES	0,067	0,001	-0,833	-1,313	-0,353
	medium SES		0,003	-0,570	-0,944	-0,196
	low SES					
HYPOTHESIS OF DIFFERENT VULNERABILITY						
mother's education: university						
smoking	non-smokers	0,069	0,034	-0,562	-1,082	-0,042
	smokers					
alcohol consump.	abstinents	0,098	0,000	-0,867	-1,277	-0,458
	consumers					

		Adjusted R Squared	sig	B	95% Confidence Interval lower upper	
HYPOTHESIS OF DIFFERENT EXPOSURE						
mother's education: secondary						
smoking	non-smokers	0,078	0,000	-0,823	-1,106	-0,539
	smokers					
alcohol	abstinents	0,089	0,000	-0,871	-1,113	-0,629
consump.	consumers					
HYPOTHESIS OF DIFFERENT VULNERABILITY						
mother's education: vocational						
smoking	non-smokers	0,108	0,000	-1,605	-1,988	-1,222
	smokers					
alcohol	abstinents	0,101	0,000	-1,401	-1,753	-1,050
consump.	consumers					
mother's occupation: high SES						
smoking	non-smokers	0,046	0,113	-0,446	-0,998	0,105
	smokers					
alcohol	abstinents	0,070	0,000	-0,772	-1,200	0,343
consump.	consumers					
mother's occupation: medium SES						
smoking	non-smokers	0,086	0,000	-0,938	-1,216	-0,661
	smokers					
alcohol	abstinents	0,097	0,000	-0,949	-1,186	-0,712
consump.	consumers					
mother's occupation: low SES						
smoking	non-smokers	0,089	0,000	-1,481	-1,870	-1,044
	smokers					
alcohol	abstinents	0,096	0,000	-1,457	-1,927	-1,034
consump.	consumers					

DISCUSSION

The influence of HRB and SES on health was explored among Slovak adolescents with the aim of contributing to the explanation of socio-economic health differences among Slovak adolescents. The question is whether unequal distribution of HRB or differential health impact of HRB is the reason the socio-economic health differences observed among Slovak adolescents.

Youth, particularly Western European youth, is characterised more by the absence than presence of socio-economic health differences (*West 1988, West et al. 1990, MacIntyre and West 1991, Glendinning et al. 1992, Ford et al. 1994, Rahkonen et al. 1995, Tuinstra 1998*). In contrast, Halldorsson et al. (2000) confirmed inequalities in health according to SES, as reported by parents, among adolescents in all the Nordic countries. Similarly, Geckova et al. (2001d) show that there is considerable evidence of socio-economic health differences among Slovak adolescents, and the trends in these differences are more unfavourable for adolescents of lower SES.

Smoking and alcohol consumption is related to poorer health among adolescents (*Rahkonen et al. 1993, Poikolainen et al. 1995, Twisk et al. 1997, Tynjälä et al. 1997, Boreham et al. 1999, Geckova et al. 2000b, Holmen et al. 2000*). Smoking, drinking of alcohol can influence health already in adolescence, but we should take in account also the possibility, that this behaviour is used as a coping mechanism with relation to existing psychosomatic problems. Particularly when cross-sectional data are only available and subjective health indicators are used, the reason of the association between the higher prevalence of health problems with the higher prevalence and frequency of smoking, drinking of alcohol can be a coincidence and not a causal relationship. To differ the causal relationship from the coincidence requires further research, using longitudinal data from second wave planned in 2002.

Our findings confirmed both a socio-economical disadvantage and a presence of HRB related to the worse health of adolescents.

There are significant socio-economic differences not only in health, but also in HRB. Socio-economic differences in smoking, unfavourable for lower SES groups of adolescents, were confirmed by *Green et al. (1991), Pietila et al. (1995), Bergström et al. (1996), Karvonen and Rimpelä (1996), Lowry et al. (1996), Geckova et al. (2001e), Piko (2000)*. But they were not confirmed by *Donato et al. (1994), Donato et al. (1995), Shucksmith et al. (1997), Tuinstra et al. (1998)*. Similarly, socio-economic differences in alcohol consumption unfavourable for lower SES groups of adolescents were confirmed by *Green et al. (1991), Pietila et al. (1995), Karvonen and Rimpelä (1996), Lowry et al. (1996), Piko (2000) and Geckova et al. (2001e)*. They were not confirmed by *Glendinning et al. (1994), Tuinstra et al. (1998), and Challier et al. (2000)*. Exceptions from class patterning in alcohol consumption were reported also by *West (1988), Mackenbach (1992) and Tuinstra et al. (1998)*.

There are significantly more smokers among adolescents from lower SES groups. Similar findings were not confirmed for alcohol consumption. Smoking,

which has a detrimental effect on health, occurred more frequently in lower SES groups and contributes to socio-economic health differences among adolescents. Our findings support the hypothesis of different exposure at least partially (for smoking).

Including the interaction effects of HRB and SES on health into the explored models we found a lot of evidence for both hypotheses about socio-economic health differences. Significant interaction was confirmed in the model including HRB and SES based on mother's characteristics. We confirmed socio-economic health differences among smokers and alcohol consumers, but not among non-smokers and abstainers. It is possible that the presence of HRB opens the gate for the detrimental influence of socio-economic disadvantage on the health of adolescents. The detrimental influence of HRB is weaker in the highest SES group of adolescents. Both mechanisms, different exposure and different vulnerability, are valid for explanation of socio-economic health differences, but the former explains it more strongly.

Most often in youth studies only father's SES has been investigated. According to some studies (*van der Lucht and Groothoff 1995, Rahkonen and Lahelma 1992*), but also to our findings, the socio-economic characteristics of the mother are of even more impact for health and HRB of children and adolescents than those of the fathers. Social role of mother includes monitoring of family members health symptoms, taking care about health of family members (*Gijsbers van Wijk and Kolk 1997*). Mother's education, including health education seems to be of higher importance in comparison to those of fathers. Our previous findings support this hypotheses: Adolescents talk the most frequently about selected problems, particularly health problems with mother (*Geckova et al. 2000e*).

A frequently discussed issue is the validity of SES indicators based on adolescent's own report. Tuinstra (*1998*) compared answers about the parents' education and occupation provided by adolescents and parents and found a high degree of agreement. The response rates were higher in adolescents' reports in comparison to parents' reports. Glendinning et al. (*1992*) confirmed the stability of the reported paternal social class composition over time.