

# Early Tracking and Peer Effects in Smoking

## Abstract

Students often begin smoking on a daily basis after they are re-sorted between elementary and secondary education. We employ a novel identification strategy based on the model of school choice, in order to estimate peer effects in youth smoking. Based on this model, self-selection is minimized by controlling for students' pre-secondary school behavior and the prior smoking practices of older schoolmates. The reflection problem is addressed by peers' pre-secondary-school smoking, which is not influenced by the current interactions and enable determining who influenced whom in a peer group. The empirical findings from the Czech Republic, where the prevalence of youth smoking has reached high levels, suggest that male youth smoking is affected by classmates, while female smoking is mainly driven by the selection effect.

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## 1. Introduction

Smoking habits usually develop during secondary school, when youth underestimate the health consequences of smoking and the addictive nature of tobacco. The current sociological and economic literature suggests that many youth outcomes are determined by social interactions among peers. This topic is very important in many countries where the debate about addressing youth smoking is still far from over and finding appropriate anti-smoking policies seems to be difficult. To properly design antismoking policies, estimates of peer effects could play important role in, for example, addressing gender differences in responsiveness to peer smoking.

This paper makes the following contributions to this discussion. First, it suggests a novel identification strategy that incorporates into the estimation of peer effects school-choice decisions and addresses the main obstacles in the estimation of peer effects (Angrist (2014)) using retrospective data about individual smoking. In particular, the data allows for the differentiation of pre-secondary school smokers and non-smokers. Pre-secondary school non-smokers are considered to be those who can be potentially affected by pre-secondary smokers. The clear distinction between these two groups allows us to avoid an upward bias in the estimation of peer effects that is critically discussed in Angrist (2014).

Further, we discuss interactions of peer effects in smoking with alcohol consumption. In particular, we show that drinking alcohol is subject to qualitatively similar peer effects as in the case of smoking. Moreover, estimated peer effects in smoking are particularly strong among students, who report drinking alcohol in bars and restaurants in a peer group. This is relevant in countries like the Czech Republic, with no smoking ban in bars and restaurants and high prevalence of drinking alcohol among youth. In this context, our findings are particularly relevant for the ongoing debate about anti-smoking programs.

For the purpose of this research we employ data (European School Survey of Alcohol and Other Drugs), which cover 16-year-old students approximately seven months after entering secondary school programs, where they are exposed to new peers, as a result of re-resorting after nine years in compulsory primary education. Meeting new peers and changing the school environment at this age could be a very important moment and crucial for smoking uptake.

The estimation of peer effects is however methodologically complicated, because, as Manski (1995) and, for example, Angrist (2014) point out, observed similar behavior in a group does not prove the existence of social interactions within the group.

Manski defines three possible sources of similar behavior in a group: endogenous, contextual, and correlated effects. The endogenous effect is defined as the effect of peers' behavior on actual individual decisions, while the contextual and correlated effects are confounding factors that can also result in similar behavior within a group, but do not imply the existence of a social multiplier. Specifically, the contextual effect allows for the behavior of a member of a group to be directly influenced not by peers' behavior, but by their characteristics. For example, peers' parents can directly influence individual behavior through restrictions on smoking during a visit at their home. The correlated effect captures other factors that can result in similar behavior and are not related to social interactions with peers. For example, peers can be self-selected into a group based on similar unobserved preferences toward smoking or their smoking can be affected by an unobserved school-specific anti-smoking policy. Another important identification issue is the reflection problem (Manski, 1995), which stems from the nature of social interactions: group behavior is always the aggregation of individual behavior, and it is difficult to distinguish who influences whom in a peer group.

Based on the model of school choice, we use the following controls to reduce the bias caused by the correlated effect. First, individual pre-secondary school behavior (first cigarette use,

consumption of alcohol and marijuana) controls for the predetermined propensity to be a smoker. Second, in our model, students choose their school based on the expected propensity of peers' smoking. These expectations are created based on the observed smoking experience of older schoolmates, which also controls for school specific anti-smoking policies or sentiment.

To alleviate the reflection problem as well as the contextual problem, we use pre-secondary school classmates' smoking instead of the current smoking of peers as the key explanatory variable. Pre-secondary school smokers are those peers who affect non-daily smokers, who, in turn, make their decision about taking up daily smoking. Based on the re-sorting of classmates, one can define who influences whom in a peer group and hence solve the reflection problem. This approach also identifies the effect of other time constant characteristics of peers on individual smoking uptake, i.e. identify the contextual effects.

In what follows, a peer group is defined as a class within a one cohort at a secondary school. The key outcome variable is the current daily smoking of an individual student (alternatively, we also use a broader definition of a smoker). This approach follows Lundborg (2006), who defines a smoker as an individual who reports smoking daily or almost daily. The data also allow us to distinguish pre-secondary daily smokers from students who start to smoke daily only in secondary school.

The results suggest that peers do affect individuals' daily smoking at Czech secondary schools with a significant difference between males' and females' smoking behavior: male students are significantly more affected by peers' smoking. We also find that in peer groups where male students engage in drinking alcohol in bars and restaurants, peer effects are much stronger. Further, using a similar methodology we find qualitatively similar results for alcohol consumption: males are more responsive to peers' pre-secondary school drinking, and peer groups with a higher prevalence of drinking alcohol in bars and restaurants have higher estimates of peer effects in

smoking. These findings are important for public policy because they suggest a reinforcing effect of drinking alcohol on peer effects in smoking. Further, this is in line with the current literature (e.g. Kremer and Levy, 2008), which finds male students to be more involved in fraternities; therefore, anti-smoking policies targeting youth (e.g., smoking bans or information campaigns) can rely on peer effects as a reinforcement mechanism among male students.

## 2. Basic Methodological Issues and Literature Review

The basic econometric specification used for estimating peer effects generally has the following form:

$$(1) \quad \textit{smoke}_{i(g)} = \alpha_0 + \alpha_1 \overline{\textit{peer}}_{-i(g)} + \alpha_2 X_{i(g)} + \alpha_3 \overline{X}_{-i(g)} + \varepsilon_{i(g)}$$

where  $\textit{smoke}_{i(g)}$  is the probability of an individual  $i$  in a group  $g$  to be a daily smoker,  $\overline{\textit{peer}}_{-i(g)}$  is the average daily smoking of his/her peers in the group (after excluding individual  $i$ ),  $X_{i(g)}$  is the vector of an individual's characteristics,  $\overline{X}_{-i(g)}$  is the vector of average peers' characteristics, and  $\varepsilon_{i(g)}$  is the disturbance.

The three most-often addressed problems encountered when estimating equation (1) are reflection, self-selection, and the omission of a school specific antismoking sentiment. All three bias the estimate of the endogenous effect ( $\alpha_1$ ) upward. The reflection problem is connected to the problem of reverse causality between  $\overline{\textit{peer}}_{-i(g),t}$  and  $\text{Pr}(\textit{smoke}_{i(g),t})$ , because the researcher cannot observe who influences whom in a class or other peer group.

Finding a solution to the reflection problem is difficult as it is, for example, summarized in Sacerdote (2011). Kremer and Levy (2008) suggest that students' outcomes should be regressed on the pre-college outcomes of their peers rather than on contemporaneous peers' behavior. In the health literature, this approach is used by Clark and Loheac (2007). Angrist (2014) summarizes all recent literature in different fields where peer effects were estimated and he points out that all approaches that are based on regressing an individual outcome on group averages (even when individual outcome is excluded from the group average) leads mechanically to biased estimates.

Another stream of literature addresses the reflection problem using an instrumental variable approach (e.g., Powell et al., 2005; Gaviar et al., 2001; Fletcher, 2010). However, finding a credible instrument predicting  $\overline{peer}_{-i(g)}$  but excluded from the model (1) is difficult if researchers do not provide additional controls for self-selection. Further, this approach has a clear limitation for the problem that Angrist points out: regressing an individual outcome on group variables generates a mechanical association. Authors typically assume that some of peers' characteristics do not directly affect an individual's decision to take up smoking and use these characteristics as instruments, making the assumption that the contextual effect does not exist ( $\alpha_3$  is equal to zero).

In this paper, we use an approach similar to that of Carrell et al. (2013), Eisenberg et al.(2013), Kremer and Levy (2008) or Clark and Loheac (2007), who all used pre-school outcomes of peers as explanatory variables. All these studies could be criticized by Angrist's argument that by regressing individual outcomes on peers lagged outcome causes upward bias. We address this issue by assuming that the majority of classmates cannot have influenced each other before their enrollment into a secondary school (details about the institutional setting are explained in the next section). Therefore, we can define pre-secondary school smokers and non-smokers and we can define who influence whom among classmates and avoid upward bias in the estimation peer effects.

Apart from the reflection problem, it is also necessary to address self-selection into schools and the potential presence of a school specific smoking environment.

The self-selection problem arises when a peer group is created based on some common unobserved factors affecting the peers' smoking and the individual's decision to smoke. For example, children with a similar family background that affects their propensity to become a smoker can sort themselves into specific schools. In the context of equation (1) the selection issue is reflected in the correlation of the common part of the error term  $\varepsilon_{i(g)}$  with smoking prevalence  $\overline{peer}_{-i(g)}$ .

The most credible solution to this problem is a direct randomized assignment of individuals into peer groups. Randomized experiments are, however, rarely available to study secondary school students as secondary school systems are inherently based on sorting of students into schools based in part on unobservable characteristics. To overcome this selection problem, many studies (e.g., Fletcher, 2010 or Lunborg, 2006) use school fixed effects that control for all unobserved characteristics of a school as well as average unobservables of the school's students. Thus, their estimation uses only within-school variation in peers' behavior, which is claimed to be random. This approach can also be questioned, however, because existing evidence shows that students can be non-randomly assigned into classes based on their abilities and other characteristics. If this is the case, the estimates are again biased upward. On the other hand, it is also known that fixed effect estimation in the presence of sorting can cause a downward bias of the estimates due to the negative correlation between unobserved and observed characteristics of students within a school (Bayer and Ross, 2006). Thus the total bias of fixed effect analysis is unknown.

We propose an alternative solution, which directly controls for unobserved school-specific characteristics of students using information about pre-secondary school individual experience with smoking, alcohol and cannabis consumption and using a natural assumption about the choice of

school, namely that applicants derive their expectations about the school's smoking attitude based on the smoking prevalence among currently enrolled students. The regression analysis thus employs older students' smoking as a proxy for expectations and preferences of fresh students toward smoking. This approach respects the design of the enrollment process and is suitable for the data that are widely available for European countries.

The next section describes the institutional setting of Czech secondary schools and the identification strategy in detail.

### 3. Institutional Setting and Identification Strategy

The Czech secondary school system is characterized by the tracking of students (Brunello and Checchi, 2008). Individuals usually attend their neighborhood elementary school and the majority of Czech youth are enrolled into secondary schools based on their choice and an admission exam administered at the age of 15, after completion of the 9th grade at elementary school.

Secondary schools can be divided into three basic types: academic, vocational, and apprenticeship. Academic and vocational schools usually provide four-year secondary programs<sup>1</sup> and students take a school-leaving exam (the so-called 'Maturita') at the end of these programs. The 'Maturita' is a prerequisite for tertiary education and obligatory for all students at vocational and academic schools. Apprenticeship programs do not lead to 'Maturita' and apprentices do not apply to colleges and universities, but usually become blue collar workers<sup>2</sup>. As Munich (2004) points out, apprenticeship programs usually draw pupils from the lower end of the ability distribution.

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<sup>1</sup> Some academic schools also provide an 8 year program, to which students are enrolled after their 5th year at an elementary school. According to the manager of the ESPAD survey in the Czech Republic, it cannot be ruled out that a few classes from the 8-year track schools were included. However, the analysis on the sample not containing academic schools does not show any major differences in results.

<sup>2</sup> Apprenticeship programs correspond to the ISCED 2 level, according to the OECD ranking. Secondary schools with 'Maturita' correspond to the ISCED 3A level.



The main difference between academic and vocational schools is in their curriculum. Academic schools provide a general education that prepares graduates for college and university studies. Vocational schools provide an education focused on various fields: technical, business, pedagogical, and healthcare. Their graduates are expected to be ready to enter the labor market as well as colleges in their particular field.

The majority (approximately 80%) of Czech secondary schools are public and do not charge a tuition fee. All secondary schools typically organize their own written entrance exams, which play a crucial role in the admissions process (GPA from primary school is also taken into account). Although information about the admissions process is not fully public, it is possible to employ the following assumptions. Firstly, classes at primary schools are generally heterogeneous in skill distribution and students from one class are usually admitted to different secondary schools. According to our own computation from the PISA 2003 survey, chances that classmates at primary school apply to the same narrowly defined type of secondary school are on average less than 20%. Moreover, applying to the same secondary school does not imply that students will meet in the same school or class. There are usually many different schools within a reach of one elementary school. In case that students apply to the same school, they have to go through the examination process and after that they are further resorted into classes within the secondary school. Chances that classmates from primary school become classmates in a secondary school are therefore fairly low.

The admissions process has been recently under reform. The data cover the period 1999-2003, when the admissions process had the following form. Graduates from primary school apply at most to two secondary schools that are of interest to them. These secondary schools then select

applicants based on results of entrance exams (and previous GPA). If an applicant is not successful in the first round, he/she enters a second round<sup>3</sup>.

This mechanism has the following implications for the proposed identification strategy. First, there is a low chance that peers from one class at the secondary school could have interacted with each other before they were enrolled into the school. The second implication is that students can choose their schools based on their observed and unobserved characteristics potentially affecting their smoking.

The first implication helps us to solve the reflection problem employing a similar method suggested in Angrist (2014): by using predetermined smoking instead of current smoking. Thus, the baseline specification for smoking behavior<sup>4</sup> has the following form:

$$(2) \quad \text{smoke}_{i(g),t} = \alpha_0 + \alpha_1 \overline{\text{peer}_{-i(g),t-1}} + \alpha_2 \text{Exp}_{i(g),t-1} + \alpha_3 X_{i(g)} + \alpha_4 \overline{X}_{-i(g)} + \varepsilon_{i(g),t}$$

where  $\overline{\text{peer}_{-i(g),t-1}}$  is the pre-secondary school smoking of peers,  $\text{smoke}_{i(g),t}$  is the probability of an individual  $i$  becoming a daily smoker in class  $g$ ,  $\text{Exp}_{i(g),t-1}$  is the past experience of individuals with smoking cigarettes and marijuana, drinking beer and drunkenness; the remaining controls are the same as in the previously discussed Model (1) and are time invariant.

The crucial implication of Model (2) is the non-existence of reverse causality between pre-secondary school daily smoking among peers<sup>5</sup> and the probability of becoming a daily smoker.<sup>6</sup> In

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<sup>3</sup> Secondary schools were obliged to leave a certain number of free slots for the second round, and a few schools enrolled students even after the two official rounds were over.

<sup>4</sup> We also estimate an analogical model for alcohol consumption.

<sup>5</sup> The peers' pre-secondary school daily smoking most likely contains a recall measurement error that can bias the results toward zero. This problem cannot be solved in this paper. A potential solution lies in undertaking a longitudinal survey that tracks students over time.

<sup>6</sup> One can also consider a second option to avoid the reflection problem: the instrumental variable approach. Current daily smoking of peers can be instrumented by the pre-secondary school smoking of peers following the suggestion in Powell et al. (2005). The instrumental variable approach is performed as a robustness check and presented in section 5.

other words, an increase in daily smoking at secondary school cannot cause the previous experience of peers' smoking. This assumption is fulfilled by the fact that students are re-sorted between ninth grade in elementary school and first grade at secondary school. Further, in order to address Angrist's concern that regressing an individual outcome on peers' outcome and/or characteristics leads *per se* to biased estimates, we do not include pre-secondary school smokers into the estimation. They enter the estimation only through the class level variable peers smoking (*peer*).

Next, the selection problem needs to be addressed. First, specification (2) already controls for individual pre-secondary school behavioral characteristics (experience with a first cigarette, beer, marijuana and drunkenness), which should diminish selection bias based on pre-secondary school experience with risky behavior. The data also allows controlling for family characteristics that do not change over time (education of parents, completeness of family, and the smoking of older siblings<sup>7</sup>). The data does not sufficiently cover smoking and other patterns of risky behavior among parents of students. Therefore, in our model we assume that the parental effect is constant over time and we control it for using pre-secondary school behavioral controls.

However, it is possible that self-selection can still bias the results if students sort into schools and classes based on their specific unobserved factors that can be correlated with their propensity to start smoking during the first year of secondary school. That is, students may choose a secondary school where peers are similar in some unobserved characteristics that are correlated with the potential start of daily smoking. Then the correlation between the probability of becoming a daily smoker and peers' smoking is spurious. Students just indirectly express their preferences toward smoking by their choice of school.

To overcome this problem, we assume that sorting into secondary schools is time invariant. This assumption is common in the current literature and usually results in a fixed-effect analysis

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<sup>7</sup> ESPAD does not contain information about drinking alcohol of older siblings. We cannot include this variable in the alcohol drinking regression.

(e.g., Lundborg, 2006). Here, however, we employ an approach that is also directly derived from the decision-making process of applicants about their preferred schools. In particular, the smoking behavior of third-year students is used as a control for the first year students' expectation about their future classmates. The reason is the potentially important role of third-year students' characteristics associated with smoking for the decision of applicants about their secondary schools. To clarify this approach, we consider the following model of smoking decisions and school choices.

In the first stage, individuals gain experience with smoking and related activities (alcohol and marijuana). These experiences are directly included in Model (2) using the vector of pre-secondary school characteristics  $Exp_{i(g),t-1}$ . In the second stage, students choose a secondary school and go through the admissions process. The final stage takes place at the secondary school – the decision to become a daily smoker can depend on actually revealed peers' smoking.

The second stage is crucial for the effects of selection bias. The choice of secondary school can depend on various factors: individual preferences for schools, regional supply of secondary schools, quality of secondary schools, individual budget constraints, admission process, etc. The self-selection causes a bias to the extent that applicants choose a secondary school based on unobserved characteristics that are correlated with their preferences toward smoking. This can also be expressed as a minimization of the difference (Akerlof, 1997) between individual characteristics related to smoking and expected characteristics of future peers. Applicants might choose a school  $S$  that satisfies the following condition:

$$\min\{smoke_i - E_i[peers_{-i(g),S}]\}$$

where  $smoke_i$  is a probability measure characterizing the propensity of an applicant  $i$  to smoke. It includes all observed and unobserved characteristics related to the current and potential future smoking (e.g., attitude toward smoking).  $E_i[peers_{-i(g),S}]$  is an individual expectation about future peers' characteristics, which could be associated with their smoking.

Therefore, if a student has unobserved positive preferences toward smoking (and is likely to become a daily smoker), he/she would prefer to enroll in a secondary school with peers who have similar characteristics associated with smoking, holding all other school characteristics constant. This implies that individuals who choose a particular secondary school have similar expectations about future peers, which are driven by their current smoking and by common unobserved characteristics related to initiation into smoking in the future. The individuals' expectations about future peers  $E_i[peers_{-i(g),S}]$  are unobserved, but a possible source of expectations about future peers could be the behavior of older students at the particular secondary school.<sup>8</sup>

However, the final composition of a class is influenced by many other factors, and in reality these factors should be dominating, because students primarily decide on the proximity and field of study they are interested in. In particular, the entrance exams and school policy of assigning students to particular classrooms is out of the control of applicants. Thus, the final composition of peers in a class  $g$  (subset of a school  $S$ ) has the following form:

$$(3) \quad \overline{peer}_{-i(g),S} = \overline{E_i(peer_{-i(g),S})} + \mu_{g,S}$$

where  $\mu_{g,S}$  is an unexpected "prediction" of shock that affects the composition of classroom  $g$  and  $\overline{E_i[peers_{-i(g),S}]}$  is the mean over all students' expectations, which are formed based on the older students' characteristics.

Older schoolmates' lagged smoking approximates expectations about unobserved characteristics of future peers. The unexpected shock  $\mu_g$  remains in the variation of peers' smoking to allow for the unbiased estimation of  $\alpha_1$ . The estimated coefficient  $\alpha_2$  corresponds to the effect of

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<sup>8</sup> It might be costly or not possible for applicants to search among current peers and at the same time make a correct guess about their future classmates, because they may have different preferences for schools. On the other hand, it is much more efficient to search among already enrolled older students and obtain information about their types.

past individual expectations about peers on their current smoking decision. This can also be interpreted as a neighborhood or a parental effect, because individuals were influenced by them before enrollment into the school.

The final model for smoking is following:

$$(4) \text{ smoke}_{i(g),S,t} = \alpha_0 + \alpha_1 \text{peer}_{-i(g),S,t-1} + \alpha_2 \text{Old}_{S,t-1} + \alpha_3 \text{Exp}_{i(g),S,t-1} + \alpha_4 X_{i(g),S,t} + \alpha_5 \bar{X}_{-i(g),S,t} + \varepsilon_{i(g),S,t}$$

where  $\text{Old}_{S,t-1}$  is older schoolmates' experience with daily smoking (approximated from time  $t-1$  when applicants made their enrollment decision) at secondary school  $S$ . The lagged experience with smoking helps not to confound self-selection with current social interactions between older and younger students. The main advantage of this approach is the ability to directly control for unobserved preferences of students in the secondary schools using available information about older schoolmates.

We also estimate a similar model for alcohol drinking. The main differences are the following. The main dependent variable is current drinking, which is represented by answering that the student has been drunk at least once during the last 30 days. The main variable capturing peer effects is the share of classmates that report being drunk for the first time before entering secondary school. The main purpose of this empirical analysis is to find out if a similar type of peer effects are also present for alcohol consumption. This would be a strong indication to policy makers that by focusing on one type of risky behavior the other would be likely also affected. Employing the same identification strategy for alcohol consumption can also be considered as robustness check for smoking.

#### 4. Data Description and Overview of Risky Behavior

The data comes from the European School Survey of Alcohol and Other Drugs (ESPAD). This survey primarily consists of 16-year-old high school students from 26 European countries who were asked about their tobacco, alcohol, and drug consumption. The survey has been performed in four years waves. The database includes information about current smoking, past smoking and start of daily smoking, consumption of alcohol and marijuana, education of parents, the existence of siblings, use of spare time and the type of school that the student attends, perceived riskiness of smoking, average GPA, a measure of self-esteem, and number of family members.

For the purpose of the estimation, we pool data from 1999 and 2003. The data from these years contains information about third-year students, which is crucial for my identification strategy. The main quantitative description of smoking behavior is summarized in Tables 1-5. The general prevalence of smoking is quite high. 44% of the sample report having at least one cigarette during the previous 30 days. Daily smoking is reported by 30% of the sample.

The statistics show a high variation of smoking outcomes across types of schools, but low variation across year of collection and gender. For example, the level of female smoking at academic schools is about 30% of that in apprenticeship schools (Tables 1 and 2). This suggests that a different selection mechanism and/or social interactions can exist across types of schools. This is reflected in the estimation by controlling for school-type fixed effects.

Generally, a high prevalence of smoking is accompanied by a high consumption of alcohol: 72% of females and 88% of males consumed beer in the last 30 days. The smoking of marijuana during the last 30 days reached 22% of males and 18% of females in 2003. The consumption of beer and marijuana in my specification is used to control for individual pre-secondary school behavior and preferences toward risky behavior.

Table 3 shows the self-reported start of a daily smoking habit. If a respondent reports having started daily smoking younger than 15, it is assumed to be predetermined smoking that occurred before enrollment into the secondary school. Daily smoking initiation that is reported to have begun at the age around 15 and 16 most likely happens at the time of secondary education. Based on this information the key explanatory variable is created: peers' pre-secondary school daily smoking.

Table 4 displays the descriptive statistics of third-year students' past experience with daily smoking. This is the key variable controlling for the selection of first-year students into the schools. As described earlier, past daily smoking of older students may correspond to the formation of the prospective students' expectations. A similar variation to first-year students' smoking can be observed across types of schools and years.

The descriptive statistics of all other variables and characteristics of first-year students are in Table 5. The structure of samples from 1999 and 2003 is fairly similar in many aspects, including the number of observations and classes, means of all predetermined individual characteristics (for example, age and education of parents), numbers of students in all three types of secondary schools, and geographical structure. For the purpose of estimation we pool these two samples. The time fixed effects used in estimation capture all unobserved differences between first year students surveyed in 1999 and 2003.

Finally, two different samples are presented in Table 5: with and without pre-secondary school daily smokers. In fact, there are no important differences in terms of regional structure and other non-behavioral characteristics between these two samples.

## 5. Results and Discussion

The results are presented in Tables 6 and 7 (full results are shown in Appendix). They are from linear OLS regressions determining the individual probability of being a current daily smoker in the first year at secondary school, and all standard errors are clustered at the class level. The first



presented result is from “naïve” specifications not controlling for the reflection and self-selection problem; subsequently, the reflection and selection biases are accounted for. The sample is divided into two parts: females and males, and show that social interaction has a different strength for each gender. The results in Table 6 employ the full sample including those who report pre-secondary school daily smoking, while Table 7 presents results with a restricted sample that does not contain pre-secondary school daily smokers. Results from our preferred specifications are presented in Table 7. In these specifications we do not include into our sample pre-secondary smokers. Thus the presented results do not suffer from the mechanical upward bias that is discussed in Angrist (2014). It is easy to notice that results presented in Table 7 are smaller compared to those presented in Table 6. This is in line with Angrist’s argumentation.

The Specification (1) in both tables does not control for any pre-secondary school behavioral characteristics and the key explanatory variable is the peers’ current daily smoking (individual smoking is always excluded from the peer variable). The other control variables are time fixed effects, current GPA, participation in sports on a daily basis,<sup>9</sup> parental education, older siblings’ smoking and school-type fixed effects. The effect of peers’ daily smoking on individual daily smoking is significant and positive. The coefficient is larger for males than for females.

Next, we substitute current smoking with pre-secondary school smoking to alleviate the reflection problem. The cost is the measurement error that can potentially bias the results downward as was discussed above. The estimated peer effects decreased to 0.268 for males and 0.170 for females, respectively.

The next specifications address the selection problem. First, pre-secondary school behavioral characteristics (experience with smoking, marijuana and alcohol) are included in the

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<sup>9</sup> In this approach *participation in sports on a daily basis* is not influenced by new peers at secondary school and is predetermined by his/her activity at an elementary school. In the Czech Republic, sport clubs are not associated with high schools, and children usually become members at an early age in elementary school and optionally stay there longer during their high school.

regression. These controls should also capture the family effect that is directly controlled for by the education of parents, completeness of family and the smoking of an older sibling.

The results presented in the third line of Table 7 show an approximately 40% decrease in the estimate of peer effect and they become insignificant for females. This suggests that sorting of students into secondary schools based on pre-school experience with cigarettes, drugs and alcohol strongly biases the peer effects' estimate. As described above, this does not have to capture all the bias, because classmates may have other common characteristics that could influence the individual smoking decision (contextual effects). Therefore, additional controls for other peers' characteristics (with an individual's own level excluded) are included in line (4) in Table 6 and 7: average level of parental education, family completeness, participation in sports on a daily basis, and siblings' smoking. The estimated effect of peers is lower, but the size of the decrease is smaller than in the previous cases. The peer effects for females remain insignificant.

In the final step, the potential sorting of students into schools based on their unobserved attitude toward smoking is considered using the variable *% third year daily smokers*. It is meant to capture those unobserved factors that are related to the choice of school and smoking decision. The pre-secondary school smoking of peers is the key explanatory variable and it can be observed that, by controlling for older students' smoking, the estimated effect of peers slightly decreases (line (5) in Table 7).

The effect of sorting is estimated to be positive and significant, which suggests that the sorting of students into secondary schools can exist. Intuitively, one can also interpret the impact of older students' past smoking as the influence of other school and neighborhood factors that might affect an individual's decision. The estimated effect of peers, however, does not change significantly.

We make several steps in order to better understand the underlying mechanism. We are particularly interested in identifying the link between alcohol drinking and smoking. First, we perform a similar analysis for alcohol consumption. In particular, we employ a dummy for getting drunk at least once during last thirty days as the explained variable, while the ‘peers’ variable includes getting drunk first time before being admitted to secondary school. The main difference compared to the smoking specification is in not controlling for sibling drinking, because this question is missing in the questionnaire. The results are presented in Tables 8 and 9 (full results are in Appendix). Interestingly, both results follow similar patterns regarding gender differences. Peer effects for male students are much larger compared to females. Second, we interact peers’ smoking with either individual dummy for drinking out or with the prevalence of drinking in bars and restaurants in the peer group. In Table 10 we show that for males’ smoking, this interaction is largely positive and significant. We interpret this to suggest that drinking in bars and restaurants with peers has a reinforcing impact on peer effects in smoking.

Our robustness checks related to smoking estimates are done in terms of the selection of the main dependent variable as well as in the definition of pre-secondary school smoking of peers. First, we test a different definition of main dependent variable – in particular we extend smoking from daily smoking to less frequent smoking (at least once a week). The results can be found in Table A.7 in Appendix and show no differences in estimated peer effects. Second, we redefine the lag for calculating pre-secondary school smoking of peers and change lags as presented in Tables A.11, A.12 and A.13. In the main results we use entry age 9 month before filling out questionnaire. This is rather conservative approach – real time distance was only about 7 month. We also try to set age 14 as the pre-secondary school age. In this case size of the estimated coefficients are similar, but with bigger standard errors (Table A.13).

Further we perform an instrumental variable approach that uses the pre-secondary school smoking of peers as an instrument for current peers' smoking (Tables 11 and 12). This approach should diminish the reflection problem. The first-stage regression suggests that this instrument has a very strong predictive power and is significant at the 1% level. The results for female and male students are the same as those in Tables 6 and 7. The estimate of male peer effects together with standard error increases after applying the IV approach; a possible explanation may lie in measurement errors in the pre-secondary school smoking variable, or in the endogeneity of the instrument. A second explanation could be that the IV estimates are higher because they are measuring rather the contemporaneous effects of peers on each other, rather than the effect of being in a school with peers who start smoking in the past. As illustrated in the first-stage results, starting smoking prior to secondary school is not a perfect predictor of smoking during secondary school. Thus, one can think of the reduced form estimates as analogous to "intention to treat" (ITT) with imperfect "compliance" to treatment assignment. The IV estimates scale up the ITT estimates by the inverse of the compliance rate, so approximately  $(1/0.6)$ , which is approximately in line with the observed increase in effect size. However, it is difficult to make any conclusion which of these reasons is closer to reality.

The hypothesis often tested in the literature is whether peers' smoking has a non-linear impact on an individual's decision. In order to test it, we use a similar methodology to that of Clark and Loheac (2007) and create dummy variables for each quartile of peers' pre-secondary daily smoking. The results are presented in Table 11. The estimates are not significantly different from zero or from each other. Thus the hypothesis that peer effects are linear cannot be rejected.

The next hypothesis we test whether those students who report trying marijuana before being enrolled in secondary school are more likely to be affected by peers' smoking or not. For that purpose, we create a new variable - the interaction of previous experience with marijuana and peers'

pre-secondary daily smoking. Although the estimate is positive and relatively high (0.15) for both females and males, it is not statistically significant from zero at the 10% level.

Comparing the results with the current literature is difficult due to the different institutional setting, but we can claim that the results are rather on the lower end for the estimated peer effects. For example, Lundborg (2006) estimated that increasing the number of peers' smoking by 25% increases the probability of smoking by 12 percentage points. Similar results to Lundborg's are presented in Powell et al. (2005) and Fletcher (2010). The magnitude of peer effects estimated in this paper is similar to the one in Clark and Loheac (2007), who also use lagged peers' smoking, but without any appropriate experiment that would assign students into new peer groups. They estimate that the impact of an increase in peers' smoking by 25% on individual smoking is 2.2 percentage points, while the result for Czech male youth is approximately 3 percentage points. Regarding gender differences, our results are in contradiction with those in Card et al. (2013). This might be driven by several factors, for example the definition of the peer group, which is in their case friendship connections, rather than classmates.

## 6. Conclusion and Policy Implications

In this paper, we use a novel identification strategy to determine whether the daily smoking of classmates influences smoking decisions. Several estimation issues are addressed including the endogeneity of school choice, which might be related to the smoking decision.

The main results suggest that smoking decisions are affected by peers' smoking. There are significant endogenous peer effects mainly for male students. We find similar results for alcohol consumption. Further, the interaction of alcohol consumption and smoking is most likely important, because peer effects in smoking are stronger in classes with a high prevalence of drinking in bars and restaurants. This finding has several important implications. Firstly, the decision and the

enrollment process into secondary schools have not only human capital consequences, but also important implications for risky behavior, especially in countries with early-tracking systems and high segregation of students into different schools. Secondly, public policies that attempt to influence youth smoking in Czech secondary schools can rely on the existence of a social multiplier for male students. Third, policy makers should be aware that teenage alcohol consumption and smoking are closely related. For example, by the introduction of smoking bans in bars and restaurants, one can assume a strong impact on both – smoking and drinking. Similarly, the enforcement of a ban of selling alcohol to youth in bars and restaurants can have a substantial impact on youth smoking.

This analysis also has certain limitations. First, peers are arbitrarily defined as classmates, which may be too narrow. For example, female students might spend time with peers not enrolled in the school. A social multiplier for females thus might exist, but not among classmates. On the other hand, from the policy perspective classrooms are easy to reach in terms of anti-smoking programs. A second limitation is that the analysis omits several characteristics that might play an important role, namely an individual budget constraint. Although these variables would improve the analysis, they would most likely not change the estimated difference between males and females.

My result should be also important for current policy debates about banning smoking in restaurants. It is well known that most alcohol consumption takes place in certain bars and restaurants, where control mechanisms are non-existent and teenagers have free entry. Smoking is quite common in such places and males are more likely to enter them compared to females. This is in line with our findings, which suggest that male classmates visit bars together and consume not only alcohol, but also cigarettes. If this story is true, banning smoking in Czech restaurants might help reduce smoking among youth.

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Tables: Main Results

Table 1: Trying a cigarette within the last 30 days (share, st.dev.)

School Type	1999		2003	
	Male	Female	Male	Female
Academic	.39 (.49)	.33 (.47)	.21 (.41)	.25 (.43)
Vocational	.40 (.49)	.43 (.50)	.42 (.49)	.43 (.50)
Apprenticeship	.56 (.50)	.56 (.50)	.58 (.49)	.70 (.46)
Total	.46 (.50)	.44 (.50)	.45 (.50)	.44 (.50)

Note: Self-reported smoking, first year students

Source: ESPAD data, own computations

Table 2: Current daily smoking (share, st.dev.)

School Type	1999		2003	
	Male	Female	Male	Female
Academic	.21 (.41)	.19 (.40)	.09 (.28)	.10 (.30)
Vocational	.28 (.45)	.28 (.45)	.28 (.45)	.23 (.42)
Apprenticeship	.43 (.50)	.45 (.50)	.45 (.50)	.53 (.50)
Total	.32 (.47)	.31 (.46)	.31 (.46)	.27 (.44)

Note: Self-reported daily smoking, first year students

Source: ESPAD data, own computation

Table 3: Start of daily smoking, first year students (in %)

Age	1999		2003	
	Male	Female	Male	Female
Never	61.5	62.7	59.9	61.8
11 and earlier	2.8	0.8	2.6	1.2
12	3.3	2.8	4.6	3.6
13	5.1	5.3	6.5	6.5
14	10.2	9.3	9.5	10.7
15	11.6	12.7	11.5	13.0
16 and later	5.5	6.4	5.3	3.2
avg. age	16.21	16.20	16.20	16.17

Note: Self-reported start of daily smoking, individuals are enrolled in secondary school approximately at age 15.

Source: ESPAD data, own computation

Table 4: Smoking experience of third year students, share (st.dev)

School Type	1999		2003	
	Male	Female	Male	Female
Academic	.17 (.38)	.19 (.39)	.17 (.38)	.15 (.36)
Vocational	.33 (.47)	.31 (.46)	.27 (.44)	.26 (.44)
Apprenticeship	.52 (.50)	.51 (.50)	.47 (.50)	.46 (.50)
Total	.37 (.48)	.32 (.47)	.34 (.47)	.28 (.45)

Source: ESPAD data, own computation

Table 5: Descriptive statistic

Variables	1999		2003	
	(1) Mean (st.dev.)	(2) Mean (st.dev.)	(3) Mean (st.dev.)	(4) Mean (st.dev.)
Daily smoker	0.31 (0.46)	0.21 (0.40)	0.29 (0.45)	0.17 (0.38)
Current drinker	0.40 (0.49)	0.33 (0.47)	0.41 (0.49)	0.34 (0.47)
Try cig. before sec. sch.	0.65 (0.48)	0.56 (0.50)	0.67 (0.47)	0.58 (0.49)
Drunk before sec. sch.	0.35 (0.48)	0.25 (0.43)	0.38 (0.49)	0.28 (0.45)
Try marijuana bef. sec. sch.	0.12 (0.33)	0.06 (0.23)	0.17 (0.37)	0.08 (0.27)
Drink beer before sec. sch.	0.71 (0.45)	0.65 (0.48)	0.75 (0.43)	0.69 (0.46)
Last drinking in a pub	0.58 (0.49)	0.54 (0.50)	0.60 (0.49)	0.56 (0.50)
Complete family (1 – yes)	0.78 (0.41)	0.79 (0.40)	0.76 (0.42)	0.79 (0.41)
Sport on daily basis	0.29 (0.46)	0.30 (0.46)	0.30 (0.46)	0.31 (0.46)
Father's college degree	0.17 (0.38)	0.17 (0.38)	0.26 (0.44)	0.28 (0.45)
Father's hs degree	0.41 (0.49)	0.42 (0.49)	0.28 (0.45)	0.28 (0.45)
Age	16.21 (0.40)	16.20 (0.39)	16.19 (0.41)	16.17 (0.39)
Male	0.48 (0.50)	0.47 (0.50)	0.47 (0.50)	0.47 (0.50)
GPA12	0.43 (0.50)	0.47 (0.50)	0.41 (0.49)	0.45 (0.50)
GPA34	0.46 (0.50)	0.43 (0.50)	0.45 (0.50)	0.43 (0.50)
GPA56	0.09 (0.29)	0.08 (0.27)	0.11 (0.31)	0.08 (0.28)
Older sibling smoker	0.31 (0.46)	0.27 (0.45)	0.33 (0.47)	0.30 (0.46)
Vocational school	0.45 (0.50)	0.46 (0.50)	0.40 (0.49)	0.41 (0.49)
Academic school	0.22 (0.42)	0.25 (0.43)	0.26 (0.44)	0.31 (0.46)
Apprenticeship	0.33 (0.47)	0.29 (0.46)	0.34 (0.48)	0.29 (0.45)
Regions:				
Prague	0.11 (0.31)	0.10 (0.30)	0.10 (0.30)	0.10 (0.30)
Central	0.11 (0.31)	0.11 (0.31)	0.10 (0.30)	0.10 (0.30)
South	0.07 (0.25)	0.07 (0.25)	0.07 (0.25)	0.07 (0.25)
West	0.07 (0.26)	0.07 (0.26)	0.08 (0.28)	0.08 (0.27)
North	0.13 (0.33)	0.13 (0.33)	0.13 (0.34)	0.13 (0.34)
East	0.13 (0.33)	0.13 (0.34)	0.15 (0.36)	0.15 (0.36)
Southeast	0.19 (0.40)	0.19 (0.39)	0.17 (0.38)	0.17 (0.38)
Northeast	0.20 (0.40)	0.20 (0.40)	0.20 (0.40)	0.20 (0.40)
Total number of observations	4774	3703	4766	3604
Number of classes	227	227	180	180

Note: samples (1) and (3) are full, samples (2) and (4) do not involve pre-secondary school daily smokers

Source: ESPAD data, own computation

Table 6: The estimation of peer effects (full sample)

Peers' smoking		Controls for selection	Female	Male
(1)	% current daily smokers		0.311*** (0.054)	0.446*** (0.056)
(2)	% pre-school daily smokers		0.208*** (0.063)	0.472*** (0.074)
(3)	% pre-school daily smokers	Individual pre-school behavior	0.105* (0.059)	0.346*** (0.072)
(4)	% pre-school daily smokers	(3) + peers' characteristics	0.051 (0.060)	0.218*** (0.070)
(5)	% pre-school daily smokers	(4) + % older students' lagged smoking	0.053 (0.063)	0.202*** (0.072)
(6)	% pre-school daily smokers	(5) no academic sch.	0.023 (0.074)	0.193** (0.084)

Note: Results come from OLS regressions. All specifications control for GPA, parental education, family completeness, school type, time and regional dummies. Standard errors are clustered on class level. Standard errors in parentheses, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 7: The estimation of peer effects (no pre-secondary school daily smokers)

	Peers' smoking	Controls for selection	Female	Male
(1)	% current daily smokers		0.227*** (0.061)	0.363*** (0.059)
(2)	% pre-school daily smokers		0.095 (0.066)	0.332*** (0.082)
(3)	% pre-school daily smokers	Individual pre-school behavior	0.081 (0.066)	0.296*** (0.081)
(4)	% pre-school daily smokers	(3) + peers' characteristics	0.034 (0.068)	0.169** (0.079)
(5)	% pre-school daily smokers	(4) + % older students' lagged smoking	0.042 (0.069)	0.177** (0.081)
(6)	% pre-school daily smokers	(5) no academic sch.	0.018 (0.084)	0.182* (0.095)

Note: Results are from linear probability OLS regressions. All specifications control for GPA, parental education, family completeness, school type, time and regional dummies. Standard errors are clustered on class level.

Standard errors in parentheses, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 8: The estimation of peer effects for alcohol consumption (full sample)

	Peers' drinking	Controls for selection	Female	Male
(1)	% current drinkers		0.416*** (0.090)	0.373*** (0.080)
(2)	% pre-school drinkers		0.236*** (0.063)	0.406*** (0.061)
(3)	% pre-school drinkers	Individual pre-school behavior	0.170*** (0.061)	0.334*** (0.061)
(4)	% pre-school drinkers	(3) + peers' characteristics	0.157** (0.062)	0.336*** (0.060)
(5)	% pre-school drinkers	(4) + % older students' lagged smoking	0.144** (0.063)	0.348*** (0.063)
(6)	% pre-school drinkers	(5) no academic sch.	0.132* (0.073)	0.320*** (0.070)

Note: Results come from OLS regressions. All specifications control for GPA, parental education, family completeness, school type, time and regional dummies. Standard errors are clustered on class level. Standard errors in parentheses, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 9: The estimation of peer effects in alcohol consumption (no students who have been drunk before secondary school)

	Peers' drinking	Controls for selection	Female	Male
(1)	% current drinkers		0.369*** (0.110)	0.275*** (0.097)
(2)	% pre-school drinkers		0.168** (0.072)	0.242*** (0.078)
(3)	% pre-school drinkers	Individual pre-school behavior	0.154** (0.070)	0.236*** (0.079)
(4)	% pre-school drinkers	(3) + peers' characteristics	0.144** (0.073)	0.239*** (0.078)
(5)	% pre-school drinkers	(4) + % older students' lagged smoking	0.135* (0.072)	0.258*** (0.080)
(6)	% pre-school drinkers	(5) no academic sch.	0.178** (0.087)	0.272*** (0.086)

Note: Results are from linear probability OLS regressions. All specifications control for GPA, parental education, family completeness, school type, time and regional dummies. Standard errors are clustered on class level. Standard errors in parentheses, \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

Table 10: Peer effects in smoking with interaction to drinking in pub/restaurants

	Male	Male	Male
% pre-school daily smokers	0.177** (0.081)	0.009 (0.091)	-0.143 (0.192)
Peer smoking*Last drinking in a pub		0.287*** (0.090)	
Peer smoking*Peer drinking in pub			0.484* (0.278)
	(0.023)		
Individual pre-school behavior	X	X	X
GPA and Parental Education	X	X	X
School type, time, reg. fixed effects	X	X	X
Peers' characteristics	X		
Observations	2956	2956	2956
R-squared	0.127	0.146	0.145

Table 11: Instrumental variable estimation

	Naive (female) (3)	IV (female) (4)	Naive (male) (5)	IV (male) (6)
% current daily smokers	0.151*** (0.048)	0.060 (0.094)	0.218*** (0.053)	0.281*** (0.074)
% older students lagged smokers	0.069 (0.043)	-0.026 (0.046)	0.112*** (0.034)	0.102*** (0.032)
Individual pre-school behavior	X	X	X	X
GPA and Parental Education	X	X	X	X
School type, time and regional fixed effects	X	X	X	X
Peers' characteristics	X	X	X	X
Observations	4514	4514	4079	4079
R-squared	0.35	0.35	0.23	0.23

Note: The instrument is peers' pre-secondary daily smoking. The Instrumented variable is % *current daily smokers*. we control for selection using various pre-secondary school individual behavioral characteristics, current peers' characteristics and older schoolmates lagged behavior (as a proxy for expectations).

Table 12: Instrumental variable – first stage

	Female (2)	Male (3)
% pre-school daily smokers	0.571*** (0.015)	0.558*** (0.016)
Individual pre-school behavior	X	X
GPA and Parental Education	X	X
School type, time, reg. fixed effects	X	X
Peers' characteristics	X	X
Observations	4515	4081
R-squared	0.62	0.48

Note: Explained variable is the current share of daily smokers.



Table 13: Testing for non-linearity of peer effects

	Male	Female
Peers' smoking:		
2. quartile	0.017 (0.017)	0.004 (0.022)
3. quartile	0.006 (0.018)	0.033 (0.023)
4. quartile	0.020 (0.023)	0.033 (0.026)
Individual pre-school behavior	X	X
GPA and Parental Education	X	X
School type, time, reg. fixed effects	X	X
Peers' characteristics	X	X
Observations	3648	3206
R-squared	0.24	0.17

Note: Results come from OLS regressions. Standard errors are clustered on class level (in fixed effect estimation on school level)

Table 14: Testing for peer effects for smokers of marijuana

	Female	Male
Try marijuana* % pre-school daily smokers	0.150 (0.137)	0.153 (0.121)
Try marijuana before sec. school	0.271*** (0.038)	0.208*** (0.032)
% pre-school daily smokers	0.014 (0.059)	0.10* (0.058)
Individual pre-school behavior	X	X
GPA and Parental Education	X	X
School type, time, reg. fixed effects	X	X
Peers' characteristics	X	X
Observations	3644	3195
R-squared	0.24	0.17

Note: Results come from OLS regressions. Standard errors are clustered on class level (in fixed effect estimation on school level)



## Appendix – Full Results

Table A.1 - Males, full sample

	(1)	(2)	(3)	(4)	(5)	(6)
<b>% current daily smokers</b>	<b>0.446<sup>***</sup></b> <b>(0.056)</b>					
<b>% pre-school daily smokers</b>		<b>0.472<sup>***</sup></b> <b>(0.074)</b>	<b>0.346<sup>***</sup></b> <b>(0.072)</b>	<b>0.218<sup>***</sup></b> <b>(0.070)</b>	<b>0.202<sup>***</sup></b> <b>(0.072)</b>	<b>0.193<sup>**</sup></b> <b>(0.084)</b>
Complete family	-0.070 <sup>***</sup> (0.017)	-0.070 <sup>***</sup> (0.017)	-0.047 <sup>***</sup> (0.017)	-0.044 <sup>***</sup> (0.017)	-0.036 <sup>**</sup> (0.017)	-0.034 <sup>*</sup> (0.020)
GPA12	-0.205 <sup>***</sup> (0.054)	-0.227 <sup>***</sup> (0.052)	-0.176 <sup>***</sup> (0.049)	-0.161 <sup>***</sup> (0.050)	-0.155 <sup>***</sup> (0.052)	-0.185 <sup>***</sup> (0.059)
GPA34	-0.121 <sup>**</sup> (0.054)	-0.140 <sup>***</sup> (0.052)	-0.110 <sup>*</sup> (0.050)	-0.099 <sup>**</sup> (0.049)	-0.089 <sup>*</sup> (0.052)	-0.110 <sup>*</sup> (0.059)
GPA56	0.003 (0.057)	-0.008 (0.056)	-0.005 (0.053)	0.003 (0.053)	0.011 (0.055)	-0.018 (0.061)
Year 2003	-0.018 (0.013)	-0.037 <sup>**</sup> (0.016)	-0.042 <sup>***</sup> (0.015)	-0.018 (0.017)	-0.006 (0.017)	-0.002 (0.021)
Father's hs degree	0.007 (0.017)	0.010 (0.017)	-0.000 (0.017)	-0.001 (0.017)	0.002 (0.017)	-0.008 (0.019)
Father's college degree	0.039 <sup>**</sup> (0.019)	0.035 <sup>*</sup> (0.019)	0.021 (0.019)	0.026 (0.018)	0.031 (0.019)	0.024 (0.023)
Older Sibling Smokes	0.142 <sup>***</sup> (0.016)	0.147 <sup>***</sup> (0.016)	0.108 <sup>***</sup> (0.015)	0.106 <sup>***</sup> (0.015)	0.106 <sup>***</sup> (0.016)	0.108 <sup>***</sup> (0.018)
Sport on daily basis	-0.070 <sup>***</sup> (0.014)	-0.071 <sup>***</sup> (0.014)	-0.066 <sup>***</sup> (0.014)	-0.066 <sup>***</sup> (0.013)	-0.063 <sup>***</sup> (0.014)	-0.069 <sup>***</sup> (0.016)
Vocational school	0.043 <sup>**</sup> (0.017)	0.048 <sup>**</sup> (0.021)	0.042 <sup>**</sup> (0.018)	-0.025 (0.024)	-0.037 (0.026)	-0.029 (0.024)
Apprenticeship	0.085 <sup>***</sup> (0.025)	0.123 <sup>***</sup> (0.027)	0.116 <sup>***</sup> (0.025)	0.027 (0.031)	-0.004 (0.035)	
Regions:						
Prague	-0.021 (0.023)	-0.034 (0.028)	-0.032 (0.026)	-0.007 (0.030)	-0.021 (0.030)	-0.027 (0.037)

Central	-0.056** (0.025)	-0.043 (0.033)	-0.036 (0.029)	-0.025 (0.028)	-0.013 (0.029)	-0.019 (0.036)
South	0.013 (0.030)	0.020 (0.039)	0.030 (0.038)	0.037 (0.038)	0.025 (0.038)	-0.004 (0.045)
West	-0.028 (0.023)	-0.023 (0.028)	-0.023 (0.027)	-0.025 (0.024)	-0.039 (0.026)	-0.058* (0.031)
North	-0.011 (0.021)	-0.009 (0.025)	-0.006 (0.023)	-0.010 (0.022)	-0.012 (0.023)	-0.021 (0.028)
East	-0.012 (0.019)	-0.028 (0.025)	-0.010 (0.024)	0.001 (0.022)	-0.006 (0.022)	-0.007 (0.027)
Southeast	0.007 (0.019)	-0.008 (0.024)	-0.014 (0.023)	0.010 (0.023)	0.004 (0.024)	-0.008 (0.029)
Drunk before sec. sch.			0.096*** (0.017)	0.095*** (0.017)	0.100*** (0.017)	0.103*** (0.020)
Beer before sec. sch.			0.025 (0.016)	0.028* (0.016)	0.022 (0.016)	0.018 (0.020)
Try cig. before sec. sch.			0.095*** (0.014)	0.091*** (0.014)	0.093*** (0.015)	0.121*** (0.017)
Try marijuana bef. sec. sch.			0.277*** (0.020)	0.273*** (0.020)	0.270*** (0.020)	0.265*** (0.023)
Father's college deg. of peers				-0.217*** (0.073)	-0.210*** (0.076)	-0.240*** (0.111)
Father's hs deg. of peers				0.084 (0.073)	0.116 (0.075)	0.117 (0.083)
Complete family of peers				-0.085 (0.072)	-0.049 (0.075)	-0.052 (0.083)
Sport on daily basis for peers				0.022 (0.062)	0.024 (0.062)	-0.002 (0.076)
Older siblings of peers smoke				0.236*** (0.070)	0.180** (0.072)	0.146* (0.083)
Smoking of 3 <sup>rd</sup> year students					0.163*** (0.056)	0.174*** (0.063)
Constant	0.303*** (0.058)	0.349*** (0.057)	0.179*** (0.056)	0.238** (0.103)	0.162 (0.109)	0.197* (0.116)

<i>N</i>	4236	4236	4105	4105	3886	3093
<i>R</i> <sup>2</sup>	0.139	0.134	0.230	0.237	0.242	0.214

The dependent variable is a dummy for being a daily smoker (1 = smoker, 0 = non-smoker).  
Standard errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.2 - Females, full sample

	(1)	(2)	(3)	(4)	(5)	(6)
<b>% current daily smokers</b>	<b>0.311<sup>***</sup></b> <b>(0.054)</b>					
<b>% pre-school daily smokers</b>		<b>0.208<sup>***</sup></b> <b>(0.063)</b>	<b>0.105<sup>*</sup></b> <b>(0.059)</b>	<b>0.051</b> <b>(0.060)</b>	<b>0.053</b> <b>(0.063)</b>	<b>0.023</b> <b>(0.074)</b>
Complete family	-0.079 <sup>***</sup> (0.016)	-0.082 <sup>***</sup> (0.016)	-0.049 <sup>***</sup> (0.016)	-0.048 <sup>***</sup> (0.016)	-0.043 <sup>***</sup> (0.016)	-0.047 <sup>**</sup> (0.020)
GPA12	-0.178 <sup>***</sup> (0.040)	-0.183 <sup>***</sup> (0.041)	-0.148 <sup>***</sup> (0.037)	-0.146 <sup>***</sup> (0.037)	-0.142 <sup>***</sup> (0.038)	-0.147 <sup>***</sup> (0.046)
GPA34	-0.066 <sup>*</sup> (0.040)	-0.068 <sup>*</sup> (0.040)	-0.074 <sup>**</sup> (0.037)	-0.074 <sup>**</sup> (0.037)	-0.071 <sup>*</sup> (0.038)	-0.078 <sup>*</sup> (0.045)
GPA56	0.075 (0.050)	0.079 (0.050)	0.066 (0.046)	0.065 (0.046)	0.070 (0.047)	0.053 (0.055)
Year 2003	-0.036 <sup>***</sup> (0.011)	-0.050 <sup>***</sup> (0.013)	-0.078 <sup>***</sup> (0.013)	-0.070 <sup>***</sup> (0.014)	-0.063 <sup>***</sup> (0.015)	-0.063 <sup>***</sup> (0.019)
Father's hs degree	0.011 (0.014)	0.010 (0.014)	-0.005 (0.013)	-0.004 (0.013)	-0.004 (0.014)	-0.013 (0.016)
Father's college degree	0.022 (0.017)	0.018 (0.017)	0.004 (0.016)	0.010 (0.016)	0.004 (0.016)	-0.012 (0.023)
Older Sibling Smokes	0.133 <sup>***</sup> (0.015)	0.133 <sup>***</sup> (0.015)	0.078 <sup>***</sup> (0.013)	0.077 <sup>***</sup> (0.013)	0.073 <sup>***</sup> (0.013)	0.079 <sup>***</sup> (0.016)
Sport on daily basis	-0.078 <sup>***</sup> (0.015)	-0.079 <sup>***</sup> (0.015)	-0.074 <sup>***</sup> (0.013)	-0.072 <sup>***</sup> (0.013)	-0.069 <sup>***</sup> (0.014)	-0.083 <sup>***</sup> (0.018)
Vocational school	0.023	0.042 <sup>**</sup>	0.029 <sup>*</sup>	-0.013	-0.022	-0.084 <sup>***</sup>

	(0.016)	(0.017)	(0.016)	(0.022)	(0.021)	(0.022)
Apprenticeship	0.131 <sup>***</sup>	0.187 <sup>***</sup>	0.160 <sup>***</sup>	0.097 <sup>***</sup>	0.076 <sup>**</sup>	
	(0.024)	(0.024)	(0.022)	(0.031)	(0.032)	
Regions:						
Prague	0.011	0.016	-0.028	-0.018	-0.033	-0.000
	(0.021)	(0.025)	(0.022)	(0.025)	(0.026)	(0.028)
Central	0.016	0.026	0.032	0.027	0.036	0.038
	(0.022)	(0.027)	(0.027)	(0.027)	(0.030)	(0.035)
South	-0.019	-0.022	-0.034 <sup>*</sup>	-0.027	-0.026	-0.035
	(0.014)	(0.019)	(0.019)	(0.020)	(0.020)	(0.026)
West	0.028	0.033	0.021	0.018	0.020	0.020
	(0.025)	(0.030)	(0.027)	(0.027)	(0.026)	(0.035)
North	-0.014	-0.007	-0.029	-0.036	-0.032	-0.029
	(0.020)	(0.024)	(0.022)	(0.022)	(0.023)	(0.027)
East	-0.037 <sup>*</sup>	-0.043 <sup>*</sup>	-0.042 <sup>**</sup>	-0.043 <sup>*</sup>	-0.047 <sup>**</sup>	-0.044 <sup>*</sup>
	(0.020)	(0.024)	(0.021)	(0.022)	(0.020)	(0.026)
Southeast	0.006	0.011	0.000	0.007	0.010	0.016
	(0.016)	(0.021)	(0.019)	(0.019)	(0.018)	(0.023)
Drunk before sec. sch.			0.161 <sup>***</sup>	0.160 <sup>***</sup>	0.158 <sup>***</sup>	0.163 <sup>***</sup>
			(0.017)	(0.017)	(0.017)	(0.020)
Beer before sec. sch.			0.024 <sup>*</sup>	0.025 <sup>**</sup>	0.027 <sup>**</sup>	0.025
			(0.012)	(0.012)	(0.013)	(0.016)
Try cig. before sec. sch.			0.109 <sup>***</sup>	0.110 <sup>***</sup>	0.111 <sup>***</sup>	0.128 <sup>***</sup>
			(0.013)	(0.013)	(0.013)	(0.018)
Try marijuana bef. sec. sch.			0.291 <sup>***</sup>	0.291 <sup>***</sup>	0.291 <sup>***</sup>	0.299 <sup>***</sup>
			(0.022)	(0.022)	(0.023)	(0.025)
Father's college deg. of peers				-0.109 <sup>*</sup>	-0.079	-0.023
				(0.057)	(0.054)	(0.084)
Father's hs deg. of peers				0.016	0.049	0.009
				(0.057)	(0.057)	(0.067)
Complete family of peers				-0.161 <sup>**</sup>	-0.195 <sup>***</sup>	-0.180 <sup>**</sup>
				(0.062)	(0.064)	(0.070)
Sport on daily basis for peers				-0.022	-0.007	-0.061
				(0.054)	(0.053)	(0.073)

Older siblings of peers smoke				0.075 (0.060)	0.081 (0.059)	0.066 (0.072)
Smoking of 3 <sup>rd</sup> year students					0.082 (0.056)	0.135 <sup>**</sup> (0.064)
Constant	0.304 <sup>***</sup> (0.047)	0.338 <sup>***</sup> (0.049)	0.209 <sup>***</sup> (0.043)	0.368 <sup>***</sup> (0.083)	0.344 <sup>***</sup> (0.084)	0.408 <sup>***</sup> (0.095)
<i>N</i>	4771	4771	4614	4614	4386	3138
<i>R</i> <sup>2</sup>	0.159	0.154	0.294	0.296	0.302	0.280

The dependent variable is a dummy for being a daily smoker (1 = smoker, 0 = non-smoker).  
Standard errors in parentheses, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.3- Males, restricted sample (no pre-secondary school daily smokers)

	(1)	(2)	(3)	(4)	(5)	(6)
<b>% current daily smokers</b>	<b>0.363<sup>***</sup></b> <b>(0.059)</b>					
<b>% pre-school daily smokers</b>		<b>0.332<sup>***</sup></b> <b>(0.082)</b>	<b>0.296<sup>***</sup></b> <b>(0.081)</b>	<b>0.169<sup>**</sup></b> <b>(0.079)</b>	<b>0.177<sup>**</sup></b> <b>(0.081)</b>	<b>0.182<sup>*</sup></b> <b>(0.095)</b>
Complete family	-0.073 <sup>***</sup> (0.018)	-0.074 <sup>***</sup> (0.018)	-0.068 <sup>***</sup> (0.018)	-0.064 <sup>***</sup> (0.018)	-0.056 <sup>***</sup> (0.019)	-0.056 <sup>***</sup> (0.022)
GPA12	-0.110 <sup>*</sup> (0.057)	-0.127 <sup>**</sup> (0.056)	-0.119 <sup>**</sup> (0.054)	-0.105 <sup>**</sup> (0.053)	-0.096 <sup>*</sup> (0.055)	-0.134 <sup>**</sup> (0.064)
GPA34	-0.068 (0.057)	-0.082 (0.057)	-0.076 (0.054)	-0.066 (0.053)	-0.058 (0.055)	-0.088 (0.063)
GPA56	0.013 (0.061)	0.005 (0.061)	0.005 (0.059)	0.012 (0.057)	0.028 (0.059)	-0.017 (0.067)
Year 2003	-0.021 (0.014)	-0.036 <sup>**</sup> (0.016)	-0.039 <sup>**</sup> (0.016)	-0.027 (0.018)	-0.020 (0.019)	-0.026 (0.023)
Father's hs degree	-0.000 (0.017)	0.002 (0.017)	0.001 (0.017)	0.000 (0.017)	0.004 (0.018)	-0.005 (0.021)
Father's college degree	0.024	0.020	0.018	0.022	0.030	0.033

	(0.019)	(0.019)	(0.019)	(0.019)	(0.020)	(0.025)
Older Sibling Smokes	0.114***	0.119***	0.102***	0.099***	0.101***	0.109***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.020)
Sport on daily basis	-0.044***	-0.044***	-0.045***	-0.044***	-0.038***	-0.041***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.017)
Vocational school	0.019	0.027	0.028	-0.008	-0.005	-0.026
	(0.018)	(0.021)	(0.019)	(0.026)	(0.027)	(0.025)
Apprenticeship	0.046*	0.084***	0.086***	0.028	0.021	
	(0.024)	(0.026)	(0.025)	(0.034)	(0.036)	
Regions:						
Prague	-0.024	-0.030	-0.028	-0.026	-0.035	-0.052
	(0.024)	(0.028)	(0.028)	(0.031)	(0.032)	(0.040)
Central	-0.033	-0.027	-0.029	-0.028	-0.023	-0.038
	(0.023)	(0.030)	(0.029)	(0.028)	(0.031)	(0.040)
South	0.006	0.015	0.023	0.019	0.005	-0.023
	(0.034)	(0.043)	(0.041)	(0.040)	(0.040)	(0.049)
West	-0.011	-0.006	-0.013	-0.022	-0.026	-0.043
	(0.027)	(0.032)	(0.031)	(0.028)	(0.029)	(0.035)
North	0.007	0.007	0.004	-0.009	-0.012	-0.018
	(0.023)	(0.027)	(0.026)	(0.026)	(0.027)	(0.034)
East	-0.006	-0.014	-0.006	-0.001	-0.011	-0.013
	(0.024)	(0.028)	(0.028)	(0.026)	(0.027)	(0.034)
Southeast	0.005	-0.003	-0.007	0.007	0.003	-0.010
	(0.019)	(0.023)	(0.023)	(0.023)	(0.024)	(0.030)
Drunk before sec. sch.			0.041**	0.040**	0.043**	0.045**
			(0.018)	(0.017)	(0.018)	(0.021)
Beer before sec. sch.			0.017	0.020	0.016	0.010
			(0.015)	(0.016)	(0.016)	(0.020)
Try cig. before sec. sch.			0.059***	0.057***	0.060***	0.081***
			(0.014)	(0.014)	(0.015)	(0.018)
Try marijuana bef. sec. sch.			0.194***	0.190***	0.178***	0.180***
			(0.031)	(0.031)	(0.031)	(0.037)
Father's college deg. of peers				-0.106	-0.092	-0.067
				(0.074)	(0.076)	(0.113)



Father's hs deg. of peers				0.057 (0.073)	0.072 (0.077)	0.076 (0.088)
Complete family of peers				-0.164** (0.079)	-0.120 (0.084)	-0.112 (0.092)
Sport on daily basis for peers				-0.050 (0.066)	-0.064 (0.067)	-0.113 (0.089)
Older siblings of peers smoke				0.227*** (0.074)	0.182** (0.076)	0.148* (0.088)
Smoking of 3 <sup>rd</sup> year students					0.079 (0.063)	0.090 (0.073)
Constant	0.202*** (0.061)	0.245*** (0.060)	0.172*** (0.058)	0.294*** (0.105)	0.222** (0.113)	0.291** (0.125)
<i>N</i>	3217	3217	3135	3135	2956	2255
<i>R</i> <sup>2</sup>	0.092	0.085	0.120	0.129	0.127	0.107

The dependent variable is a dummy for being a daily smoker (1 = smoker, 0 = non-smoker).

Standard errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.4 - Females, restricted sample (no pre-secondary school daily smokers)

	(1)	(2)	(3)	(4)	(5)	(6)
<b>% current daily smokers</b>	<b>0.227***</b> <b>(0.061)</b>					
<b>% pre-school daily smokers</b>		<b>0.095</b> <b>(0.066)</b>	<b>0.081</b> <b>(0.066)</b>	<b>0.034</b> <b>(0.068)</b>	<b>0.042</b> <b>(0.069)</b>	<b>0.018</b> <b>(0.084)</b>
Complete family	-0.058*** (0.016)	-0.060*** (0.016)	-0.040** (0.016)	-0.039** (0.016)	-0.034** (0.017)	-0.039* (0.022)
GPA12	-0.095** (0.042)	-0.100* (0.043)	-0.108*** (0.041)	-0.105** (0.042)	-0.109** (0.043)	-0.118** (0.053)
GPA34	-0.022 (0.041)	-0.024 (0.042)	-0.049 (0.041)	-0.047 (0.041)	-0.052 (0.042)	-0.068 (0.051)
GPA56	0.107* (0.041)	0.108* (0.042)	0.098* (0.041)	0.098* (0.041)	0.095 (0.042)	0.083 (0.051)

Year 2003	(0.057) -0.038***	(0.057) -0.047***	(0.056) -0.063***	(0.056) -0.055***	(0.058) -0.049***	(0.068) -0.049**
Father's hs degree	(0.012) -0.010	(0.014) -0.010	(0.014) -0.019	(0.016) -0.018	(0.016) -0.021	(0.021) -0.040**
Father's college degree	(0.014) 0.004	(0.014) 0.001	(0.014) -0.006	(0.014) -0.002	(0.015) -0.009	(0.018) -0.030
Older Sibling Smokes	(0.017) 0.089***	(0.017) 0.091***	(0.016) 0.068***	(0.016) 0.066***	(0.016) 0.064***	(0.023) 0.078***
Sport on daily basis	(0.016) -0.053***	(0.016) -0.054***	(0.015) -0.056***	(0.015) -0.053***	(0.016) -0.052***	(0.019) -0.061***
Vocational school	(0.014) 0.012	(0.014) 0.030*	(0.014) 0.016	(0.014) -0.014	(0.014) -0.020	(0.020) -0.055**
Apprenticeship	(0.017) 0.065**	(0.018) 0.116***	(0.017) 0.107***	(0.024) 0.062*	(0.020) 0.048	(0.025)
	(0.028)	(0.024)	(0.024)	(0.033)	(0.032)	
Regions:						
Prague	-0.017 (0.023)	-0.013 (0.026)	-0.028 (0.024)	-0.026 (0.026)	-0.042 (0.029)	-0.004 (0.031)
Central	0.047* (0.025)	0.053* (0.029)	0.046 (0.029)	0.041 (0.029)	0.056* (0.031)	0.053 (0.037)
South	-0.023 (0.020)	-0.024 (0.022)	-0.033 (0.021)	-0.030 (0.022)	-0.020 (0.022)	-0.038 (0.029)
West	0.038 (0.030)	0.042 (0.034)	0.029 (0.033)	0.029 (0.033)	0.036 (0.031)	0.031 (0.042)
North	-0.021 (0.021)	-0.015 (0.024)	-0.023 (0.024)	-0.029 (0.024)	-0.028 (0.025)	-0.026 (0.032)
East	-0.014 (0.019)	-0.021 (0.022)	-0.027 (0.021)	-0.028 (0.021)	-0.028 (0.019)	-0.029 (0.026)
Southeast	0.018 (0.018)	0.020 (0.022)	0.013 (0.021)	0.017 (0.021)	0.023 (0.020)	0.028 (0.026)
Drunk before sec. sch.			0.097*** (0.019)	0.096*** (0.019)	0.094*** (0.019)	0.101*** (0.023)
Beer before sec. sch.			0.019 (0.012)	0.021* (0.012)	0.021 (0.013)	0.014 (0.017)

Try cig. before sec. sch.		0.085 <sup>***</sup>		0.086 <sup>***</sup>	0.088 <sup>***</sup>	0.096 <sup>***</sup>
		(0.013)		(0.013)	(0.014)	(0.018)
Try marijuana bef. sec. sch.		0.207 <sup>***</sup>		0.208 <sup>***</sup>	0.200 <sup>***</sup>	0.226 <sup>***</sup>
		(0.039)		(0.039)	(0.040)	(0.048)
Father's college deg. of peers				-0.062	-0.024	-0.005
				(0.059)	(0.054)	(0.084)
Father's hs deg. of peers				0.031	0.064	0.042
				(0.063)	(0.065)	(0.080)
Complete family of peers				-0.135 <sup>**</sup>	-0.176 <sup>**</sup>	-0.151 <sup>**</sup>
				(0.067)	(0.069)	(0.076)
Sport on daily basis for peers				-0.049	-0.024	-0.081
				(0.057)	(0.055)	(0.079)
Older siblings of peers smoke				0.057	0.069	0.082
				(0.061)	(0.059)	(0.074)
Smoking of 3 <sup>rd</sup> year students					0.068	0.098
					(0.065)	(0.077)
Constant	0.199 <sup>***</sup>	0.230 <sup>***</sup>	0.179 <sup>***</sup>	0.305 <sup>***</sup>	0.286 <sup>***</sup>	0.329 <sup>***</sup>
	(0.048)	(0.049)	(0.048)	(0.089)	(0.090)	(0.108)
<i>N</i>	3722	3722	3623	3623	3437	2336
<i>R</i> <sup>2</sup>	0.095	0.091	0.150	0.152	0.156	0.147

The dependent variable is a dummy for being a daily smoker (1 = smoker, 0 = non-smoker).

Standard errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.5 - Males, restricted sample (no students who have been drunk before secondary school)

	(1)	(2)	(3)	(4)	(5)	(6)
<b>% current drinkers</b>	<b>0.275<sup>***</sup></b>					
	<b>(0.097)</b>					
<b>% pre-school drinker</b>		<b>0.242<sup>***</sup></b>	<b>0.236<sup>***</sup></b>	<b>0.239<sup>***</sup></b>	<b>0.258<sup>***</sup></b>	<b>0.272<sup>***</sup></b>
		<b>(0.078)</b>	<b>(0.079)</b>	<b>(0.078)</b>	<b>(0.080)</b>	<b>(0.086)</b>
Complete family	-0.043 <sup>*</sup>	-0.042 <sup>*</sup>	-0.034	-0.037	-0.027	-0.042

	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.028)
GPA12	-0.102	-0.102	-0.068	-0.075	-0.044	-0.010
	(0.065)	(0.065)	(0.063)	(0.063)	(0.064)	(0.065)
GPA34	-0.034	-0.037	-0.018	-0.025	0.002	0.027
	(0.063)	(0.063)	(0.061)	(0.061)	(0.063)	(0.064)
GPA56	0.046	0.043	0.058	0.056	0.080	0.113*
	(0.067)	(0.067)	(0.066)	(0.066)	(0.067)	(0.068)
Year 2003	-0.023	-0.030	-0.029	-0.019	-0.015	-0.027
	(0.020)	(0.020)	(0.020)	(0.023)	(0.023)	(0.026)
Father's hs degree	-0.025	-0.027	-0.025	-0.027	-0.030	-0.028
	(0.021)	(0.021)	(0.022)	(0.022)	(0.022)	(0.024)
Father's college degree	-0.034	-0.037	-0.033	-0.035	-0.037	-0.038
	(0.025)	(0.025)	(0.026)	(0.026)	(0.026)	(0.032)
Sport on daily basis	0.035*	0.034*	0.030	0.029	0.025	0.025
	(0.019)	(0.019)	(0.019)	(0.019)	(0.020)	(0.023)
Vocational school	0.034	0.033	0.031	0.039	0.025	-0.044
	(0.029)	(0.029)	(0.029)	(0.034)	(0.037)	(0.029)
Apprenticeship	0.083***	0.071**	0.070**	0.101**	0.075	
	(0.032)	(0.034)	(0.034)	(0.045)	(0.049)	
Regions:						
Prague	0.033	0.032	0.037	0.037	0.027	0.086
	(0.041)	(0.044)	(0.044)	(0.047)	(0.048)	(0.056)
Central	-0.060*	-0.053	-0.044	-0.043	-0.034	-0.012
	(0.036)	(0.038)	(0.037)	(0.038)	(0.042)	(0.050)
South	0.029	0.047	0.053	0.050	-0.019	0.013
	(0.051)	(0.053)	(0.054)	(0.057)	(0.056)	(0.076)
West	0.044	0.060	0.052	0.064	0.057	0.064
	(0.043)	(0.041)	(0.041)	(0.039)	(0.041)	(0.048)
North	-0.007	-0.012	-0.008	-0.005	-0.012	0.025
	(0.030)	(0.031)	(0.031)	(0.032)	(0.033)	(0.039)
East	0.043	0.058*	0.055	0.046	0.038	0.046
	(0.036)	(0.035)	(0.034)	(0.035)	(0.036)	(0.040)
Southeast	0.043	0.043	0.036	0.034	0.037	0.044
	(0.028)	(0.027)	(0.027)	(0.027)	(0.027)	(0.031)

Beer before sec. sch.		0.053 <sup>***</sup>	0.049 <sup>**</sup>	0.047 <sup>**</sup>	0.043 <sup>*</sup>	
		(0.019)	(0.019)	(0.020)	(0.024)	
Try cig. before sec. sch.		0.078 <sup>***</sup>	0.077 <sup>***</sup>	0.072 <sup>***</sup>	0.070 <sup>***</sup>	
		(0.021)	(0.020)	(0.021)	(0.025)	
Try marijuana bef. sec. sch.		0.171 <sup>***</sup>	0.175 <sup>***</sup>	0.152 <sup>***</sup>	0.126 <sup>**</sup>	
		(0.049)	(0.049)	(0.050)	(0.058)	
Father's college deg. of peers			0.047	0.031	0.066	
			(0.098)	(0.103)	(0.130)	
Father's hs deg. of peers			0.098	0.121	0.007	
			(0.087)	(0.092)	(0.101)	
Complete family of peers			0.180 <sup>*</sup>	0.177 <sup>*</sup>	0.137	
			(0.098)	(0.103)	(0.112)	
Sport on daily basis for peers			0.052	0.046	-0.024	
			(0.069)	(0.070)	(0.080)	
Smoking of 3 <sup>rd</sup> year students				0.075	0.059	
				(0.071)	(0.075)	
Constant	0.322 <sup>***</sup>	0.281 <sup>***</sup>	0.166 <sup>**</sup>	-0.046	-0.102	0.041
	(0.074)	(0.078)	(0.077)	(0.122)	(0.127)	(0.132)
<i>N</i>	2463	2463	2439	2439	2293	1769
<i>R</i> <sup>2</sup>	0.039	0.039	0.059	0.061	0.058	0.041

The dependent variable is a dummy for getting drunk in the 30 days prior to the survey (1 = drinker, 0 = non-drinker).

Standard errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.6 - Females, restricted sample (no students who have been drunk before secondary school)

	(1)	(2)	(3)	(4)	(5)	(6)
<b>% current drinkers</b>	<b>0.369<sup>***</sup></b>					
	<b>(0.110)</b>					
<b>% pre-school drinker</b>		<b>0.168<sup>**</sup></b>	<b>0.154<sup>**</sup></b>	<b>0.144<sup>**</sup></b>	<b>0.135<sup>*</sup></b>	<b>0.178<sup>**</sup></b>
		<b>(0.072)</b>	<b>(0.070)</b>	<b>(0.073)</b>	<b>(0.072)</b>	<b>(0.087)</b>
Complete family	-0.029	-0.029	-0.019	-0.018	-0.017	-0.016

	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.024)
GPA12	-0.072	-0.073	-0.075	-0.074	-0.080	-0.063
	(0.053)	(0.053)	(0.050)	(0.050)	(0.052)	(0.060)
GPA34	-0.041	-0.041	-0.051	-0.051	-0.068	-0.061
	(0.053)	(0.053)	(0.051)	(0.051)	(0.053)	(0.061)
GPA56	0.049	0.051	0.029	0.027	0.018	0.013
	(0.061)	(0.061)	(0.059)	(0.060)	(0.061)	(0.067)
Year 2003	0.023	0.014	0.005	0.012	0.013	-0.003
	(0.016)	(0.017)	(0.017)	(0.020)	(0.021)	(0.027)
Father's hs degree	0.002	0.000	-0.002	-0.001	-0.002	-0.010
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.022)
Father's college degree	-0.025	-0.029	-0.021	-0.017	-0.023	-0.030
	(0.022)	(0.022)	(0.021)	(0.022)	(0.023)	(0.033)
Sport on daily basis	-0.008	-0.009	-0.014	-0.015	-0.015	-0.020
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.023)
Vocational school	0.059 <sup>***</sup>	0.057 <sup>***</sup>	0.043 <sup>**</sup>	0.023	0.031	-0.100 <sup>***</sup>
	(0.019)	(0.020)	(0.020)	(0.029)	(0.027)	(0.032)
Apprenticeship	0.144 <sup>***</sup>	0.133 <sup>***</sup>	0.116 <sup>***</sup>	0.093 <sup>**</sup>	0.128 <sup>***</sup>	
	(0.026)	(0.028)	(0.028)	(0.042)	(0.042)	
Regions:						
Prague	-0.008	-0.011	0.004	0.028	0.025	0.049
	(0.028)	(0.030)	(0.030)	(0.035)	(0.036)	(0.043)
Central	0.010	0.026	0.015	0.015	0.016	0.025
	(0.029)	(0.031)	(0.030)	(0.030)	(0.032)	(0.038)
South	-0.047 <sup>*</sup>	-0.039 <sup>*</sup>	-0.051 <sup>**</sup>	-0.043	-0.027	-0.025
	(0.024)	(0.023)	(0.025)	(0.026)	(0.026)	(0.037)
West	0.024	0.031	0.009	0.004	0.009	0.012
	(0.040)	(0.041)	(0.039)	(0.040)	(0.043)	(0.050)
North	-0.022	-0.030	-0.034	-0.033	-0.041	-0.070 <sup>*</sup>
	(0.030)	(0.031)	(0.032)	(0.033)	(0.032)	(0.036)
East	-0.035	-0.024	-0.025	-0.024	-0.029	-0.025
	(0.025)	(0.026)	(0.025)	(0.025)	(0.024)	(0.031)
Southeast	0.010	0.016	0.019	0.028	0.025	0.017
	(0.026)	(0.027)	(0.027)	(0.028)	(0.028)	(0.035)

Beer before sec. sch.		0.045 <sup>***</sup>	0.046 <sup>***</sup>	0.044 <sup>***</sup>	0.034
		(0.016)	(0.016)	(0.016)	(0.021)
Try cig. before sec. sch.		0.103 <sup>***</sup>	0.102 <sup>***</sup>	0.107 <sup>***</sup>	0.095 <sup>***</sup>
		(0.016)	(0.016)	(0.017)	(0.021)
Try marijuana bef. sec. sch.		0.093 <sup>**</sup>	0.092 <sup>**</sup>	0.077	0.122 <sup>**</sup>
		(0.046)	(0.046)	(0.047)	(0.054)
Father's college deg. of peers			-0.113	-0.072	-0.022
			(0.079)	(0.078)	(0.114)
Father's hs deg. of peers			-0.011	0.014	-0.032
			(0.078)	(0.080)	(0.095)
Complete family of peers			-0.033	-0.028	-0.015
			(0.093)	(0.095)	(0.112)
Sport on daily basis for peers			0.105	0.119	0.254 <sup>***</sup>
			(0.072)	(0.073)	(0.097)
Smoking of 3 <sup>rd</sup> year students				-0.074	-0.054
				(0.071)	(0.086)
Constant	0.222 <sup>***</sup>	0.213 <sup>***</sup>	0.150 <sup>***</sup>	0.185 <sup>*</sup>	0.194 <sup>*</sup>
	(0.058)	(0.059)	(0.057)	(0.110)	(0.115)
<i>N</i>	3234	3234	3193	3193	3030
<i>R</i> <sup>2</sup>	0.041	0.037	0.060	0.062	0.063
					0.050

The dependent variable is a dummy for getting drunk in the 30 days prior to the survey (1 = drinker, 0 = non-drinker). Standard errors in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.7 – Changing the definition of the dependent variable - Males, restricted sample (no pre-secondary school daily smokers)

(1) (2) (3) (4) (5) (6)

<b>% current daily smokers</b>	<b>0.392<sup>***</sup></b>					
	<b>(0.065)</b>					
<b>% pre-school daily smokers</b>		<b>0.339<sup>***</sup></b>	<b>0.290<sup>***</sup></b>	<b>0.176<sup>**</sup></b>	<b>0.198<sup>**</sup></b>	<b>0.189<sup>*</sup></b>
		<b>(0.088)</b>	<b>(0.088)</b>	<b>(0.089)</b>	<b>(0.087)</b>	<b>(0.104)</b>
Complete family	-0.076 <sup>***</sup>	-0.077 <sup>***</sup>	-0.070 <sup>***</sup>	-0.067 <sup>***</sup>	-0.059 <sup>***</sup>	-0.064 <sup>***</sup>
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.024)
GPA12	-0.130 <sup>**</sup>	-0.143 <sup>**</sup>	-0.131 <sup>**</sup>	-0.119 <sup>**</sup>	-0.095 <sup>*</sup>	-0.147 <sup>**</sup>
	(0.058)	(0.058)	(0.056)	(0.054)	(0.053)	(0.059)
GPA34	-0.078	-0.088	-0.082	-0.074	-0.049	-0.093
	(0.058)	(0.058)	(0.055)	(0.054)	(0.052)	(0.058)
GPA56	0.002	-0.003	-0.003	0.004	0.034	-0.018
	(0.061)	(0.062)	(0.059)	(0.057)	(0.055)	(0.061)
Year 2003	-0.005	-0.005	-0.007	0.014	0.021	0.026
	(0.015)	(0.018)	(0.018)	(0.021)	(0.021)	(0.026)
Father's hs degree	-0.002	-0.001	-0.001	-0.003	-0.002	-0.012
	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)	(0.021)
Father's college degree	0.010	0.004	0.003	0.007	0.014	0.004
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.026)
Older Sibling Smokes	0.131 <sup>***</sup>	0.136 <sup>**</sup>	0.109 <sup>**</sup>	0.108 <sup>***</sup>	0.110 <sup>***</sup>	0.113 <sup>***</sup>
	(0.018)	(0.018)	(0.018)	(0.018)	(0.019)	(0.021)
Sport on daily basis	-0.045 <sup>***</sup>	-0.044 <sup>***</sup>	-0.046 <sup>***</sup>	-0.045 <sup>***</sup>	-0.036 <sup>**</sup>	-0.038 <sup>**</sup>
	(0.015)	(0.016)	(0.016)	(0.015)	(0.016)	(0.019)
Vocational school	0.011	0.026	0.027	-0.024	-0.010	-0.030
	(0.021)	(0.025)	(0.023)	(0.033)	(0.031)	(0.028)
Apprenticeship	0.034	0.078 <sup>***</sup>	0.080 <sup>***</sup>	0.013	0.023	
	(0.028)	(0.030)	(0.030)	(0.041)	(0.041)	
Regions:						
Prague	-0.026	-0.028	-0.026	-0.017	-0.033	-0.044
	(0.026)	(0.031)	(0.030)	(0.034)	(0.035)	(0.043)
Central	-0.051 <sup>**</sup>	-0.048	-0.050	-0.048	-0.040	-0.058
	(0.025)	(0.033)	(0.033)	(0.032)	(0.035)	(0.045)
South	0.002	0.019	0.024	0.018	-0.009	-0.017
	(0.038)	(0.048)	(0.045)	(0.045)	(0.040)	(0.051)
West	-0.019	-0.008	-0.014	-0.022	-0.024	-0.033



	(0.031)	(0.036)	(0.037)	(0.034)	(0.036)	(0.043)
North	-0.006	-0.008	-0.011	-0.021	-0.026	-0.026
	(0.026)	(0.031)	(0.029)	(0.029)	(0.030)	(0.038)
East	-0.014	-0.020	-0.011	-0.007	-0.027	-0.035
	(0.027)	(0.033)	(0.032)	(0.031)	(0.030)	(0.037)
Southeast	-0.003	-0.001	-0.005	0.011	0.003	-0.012
	(0.022)	(0.027)	(0.027)	(0.028)	(0.028)	(0.036)
Drunk before sec. sch.			0.055***	0.054***	0.054***	0.048**
			(0.018)	(0.018)	(0.019)	(0.022)
Beer before sec. sch.			0.025	0.027	0.024	0.016
			(0.017)	(0.017)	(0.018)	(0.022)
Try cig. before sec. sch.			0.093***	0.090***	0.093***	0.110***
			(0.016)	(0.016)	(0.017)	(0.020)
Try marijuana bef. sec. sch.			0.226***	0.224***	0.215***	0.212***
			(0.032)	(0.031)	(0.031)	(0.037)
Father's college deg. of peers				-0.150	-0.108	-0.057
				(0.092)	(0.090)	(0.134)
Father's hs deg. of peers				0.097	0.124	0.119
				(0.082)	(0.085)	(0.094)
Complete family of peers				-0.124	-0.076	-0.037
				(0.086)	(0.091)	(0.100)
Sport on daily basis for peers				-0.056	-0.075	-0.110
				(0.077)	(0.077)	(0.100)
Older siblings of peers smoke				0.194**	0.156*	0.151
				(0.086)	(0.089)	(0.103)
Smoking of 3 <sup>rd</sup> year students					0.051	0.073
					(0.069)	(0.079)
Constant	0.247***	0.305***	0.201***	0.302**	0.200	0.251*
	(0.062)	(0.064)	(0.063)	(0.123)	(0.123)	(0.134)
<i>N</i>	3217	3217	3135	3135	2956	2255
<i>R</i> <sup>2</sup>	0.091	0.081	0.130	0.137	0.136	0.114

The dependent variable is a dummy for being an almost daily smoker (1 = smoker, 0 = non-smoker).  
Standard errors in parentheses, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.8 – Changing the definition of the dependent variable - Females, restricted sample (no pre-secondary school daily smokers)

	(1)	(2)	(3)	(4)	(5)	(6)
<b>% current daily smokers</b>	<b>0.311<sup>***</sup></b>					
	<b>(0.067)</b>					
<b>% pre-school daily smokers</b>		<b>0.150<sup>*</sup></b>	<b>0.121</b>	<b>0.048</b>	<b>0.052</b>	<b>0.017</b>
		<b>(0.079)</b>	<b>(0.078)</b>	<b>(0.079)</b>	<b>(0.082)</b>	<b>(0.098)</b>
Complete family	-0.057 <sup>***</sup>	-0.060 <sup>***</sup>	-0.037 <sup>**</sup>	-0.037 <sup>**</sup>	-0.029	-0.024
	(0.017)	(0.018)	(0.018)	(0.018)	(0.018)	(0.023)
GPA12	-0.121 <sup>***</sup>	-0.130 <sup>***</sup>	-0.141 <sup>***</sup>	-0.136 <sup>***</sup>	-0.141 <sup>***</sup>	-0.160 <sup>***</sup>
	(0.046)	(0.046)	(0.044)	(0.044)	(0.046)	(0.056)
GPA34	-0.025	-0.028	-0.057	-0.053	-0.061	-0.082
	(0.046)	(0.046)	(0.045)	(0.045)	(0.046)	(0.055)
GPA56	0.127 <sup>**</sup>	0.128 <sup>**</sup>	0.112 <sup>*</sup>	0.112 <sup>*</sup>	0.113 <sup>*</sup>	0.095
	(0.059)	(0.059)	(0.058)	(0.058)	(0.059)	(0.069)
Year 2003	0.009	0.013	-0.007	0.005	0.011	0.020
	(0.014)	(0.017)	(0.016)	(0.019)	(0.019)	(0.025)
Father's hs degree	0.005	0.005	-0.007	-0.002	-0.005	-0.008
	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)	(0.019)
Father's college degree	-0.009	-0.016	-0.025	-0.014	-0.022	-0.031
	(0.020)	(0.020)	(0.019)	(0.019)	(0.020)	(0.027)
Older Sibling Smokes	0.124 <sup>***</sup>	0.127 <sup>***</sup>	0.099 <sup>***</sup>	0.096 <sup>***</sup>	0.096 <sup>***</sup>	0.099 <sup>***</sup>
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.020)
Sport on daily basis	-0.052 <sup>***</sup>	-0.054 <sup>***</sup>	-0.057 <sup>***</sup>	-0.052 <sup>***</sup>	-0.049 <sup>***</sup>	-0.063 <sup>***</sup>
	(0.017)	(0.017)	(0.016)	(0.016)	(0.017)	(0.023)
Vocational school	0.007	0.034	0.015	-0.051 <sup>*</sup>	-0.057 <sup>**</sup>	-0.021
	(0.020)	(0.022)	(0.021)	(0.028)	(0.026)	(0.032)
Apprenticeship	0.035	0.102 <sup>***</sup>	0.086 <sup>***</sup>	-0.010	-0.026	
	(0.031)	(0.027)	(0.027)	(0.039)	(0.042)	
Regions:						
Prague	-0.007	-0.003	-0.016	0.006	-0.009	-0.000

	(0.023)	(0.028)	(0.027)	(0.028)	(0.031)	(0.036)
Central	0.043*	0.055*	0.048	0.045	0.057*	0.044
	(0.026)	(0.031)	(0.030)	(0.030)	(0.033)	(0.040)
South	-0.019	-0.021	-0.028	-0.022	-0.009	-0.043
	(0.024)	(0.030)	(0.030)	(0.033)	(0.034)	(0.046)
West	0.040	0.048	0.033	0.034	0.039	0.013
	(0.035)	(0.042)	(0.041)	(0.040)	(0.037)	(0.051)
North	-0.031	-0.021	-0.036	-0.039	-0.037	-0.033
	(0.022)	(0.026)	(0.024)	(0.024)	(0.025)	(0.030)
East	-0.014	-0.018	-0.024	-0.027	-0.026	-0.042
	(0.020)	(0.024)	(0.023)	(0.024)	(0.022)	(0.030)
Southeast	0.040*	0.050*	0.045*	0.051**	0.056**	0.035
	(0.020)	(0.025)	(0.025)	(0.024)	(0.024)	(0.029)
Drunk before sec. sch.			0.119***	0.119***	0.121***	0.113***
			(0.020)	(0.020)	(0.021)	(0.024)
Beer before sec. sch.			0.033**	0.035**	0.034**	0.032*
			(0.014)	(0.014)	(0.014)	(0.019)
Try cig. before sec. sch.			0.120***	0.122***	0.123***	0.126***
			(0.015)	(0.015)	(0.016)	(0.021)
Try marijuana bef. sec. sch.			0.230***	0.234***	0.222***	0.253***
			(0.041)	(0.041)	(0.042)	(0.047)
Father's college deg. of peers				-0.181**	-0.144**	-0.082
				(0.070)	(0.067)	(0.102)
Father's hs deg. of peers				-0.013	0.020	-0.009
				(0.074)	(0.077)	(0.095)
Complete family of peers				-0.125*	-0.148*	-0.119
				(0.072)	(0.074)	(0.082)
Sport on daily basis for peers				-0.067	-0.050	-0.086
				(0.064)	(0.064)	(0.093)
Older siblings of peers smoke				0.124*	0.126*	0.150*
				(0.069)	(0.067)	(0.086)
Smoking of 3 <sup>rd</sup> year students					0.085	0.140
					(0.081)	(0.096)
Constant	0.219***	0.272***	0.201***	0.369***	0.337***	0.297***

	(0.051)	(0.053)	(0.051)	(0.098)	(0.100)	(0.111)
<i>N</i>	3722	3722	3623	3623	3437	2336
<i>R</i> <sup>2</sup>	0.101	0.093	0.164	0.168	0.170	0.156

The dependent variable is a dummy for being an almost daily smoker (1 = smoker, 0 = non-smoker).  
Standard errors in parentheses, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.9 - Interaction of peer smoking and drinking in pubs - Males, restricted sample (no pre-secondary school daily smokers)

	(1)	(2)	(3)
% pre-school daily smokers	0.177** (0.081)	0.009 (0.091)	-0.143 (0.192)
<b>Peer smoking*Last drinking in a pub</b>		<b>0.287*** (0.090)</b>	
<b>Peer smoking*Peer drinking in pub</b>			<b>0.484* (0.278)</b>
Complete family	-0.056*** (0.019)	-0.056*** (0.018)	-0.056*** (0.018)
GPA12	-0.096* (0.055)	-0.103* (0.056)	-0.097* (0.056)
GPA34	-0.058 (0.055)	-0.067 (0.056)	-0.059 (0.056)
GPA56	0.028 (0.059)	0.020 (0.060)	0.027 (0.060)
Year 2003	-0.020 (0.019)	-0.023 (0.018)	-0.025 (0.018)
Father's hs degree	0.004 (0.018)	0.006 (0.018)	0.005 (0.018)
Father's college degree	0.030 (0.020)	0.034* (0.019)	0.034* (0.019)
Older Sibling Smokes	0.101*** (0.018)	0.094*** (0.018)	0.091*** (0.018)

Sport on daily basis	-0.038*** (0.014)	-0.050*** (0.014)	-0.050*** (0.014)
Vocational school	-0.005 (0.027)	-0.006 (0.027)	-0.006 (0.027)
Apprenticeship	0.021 (0.036)	0.017 (0.036)	0.012 (0.035)
Regions:			
Prague	-0.035 (0.032)	-0.037 (0.031)	-0.040 (0.032)
Central	-0.023 (0.031)	-0.027 (0.030)	-0.033 (0.029)
South	0.005 (0.040)	-0.009 (0.040)	-0.017 (0.041)
West	-0.026 (0.029)	-0.024 (0.029)	-0.032 (0.030)
North	-0.012 (0.027)	-0.016 (0.026)	-0.021 (0.027)
East	-0.011 (0.027)	-0.016 (0.026)	-0.023 (0.027)
Southeast	0.003 (0.024)	-0.004 (0.023)	-0.012 (0.024)
Drunk before sec. sch.	0.043** (0.018)	0.035* (0.018)	0.035** (0.018)
Beer before sec. sch.	0.016 (0.016)	0.009 (0.016)	0.007 (0.016)
Try cig. before sec. sch.	0.060*** (0.015)	0.053*** (0.015)	0.053*** (0.015)
Try marijuana bef. sec. sch.	0.178*** (0.031)	0.170*** (0.031)	0.172*** (0.031)
Father's college deg. of peers	-0.092 (0.076)	-0.084 (0.075)	-0.075 (0.075)
Father's hs deg. of peers	0.072 (0.077)	0.071 (0.075)	0.072 (0.074)
Complete family of peers	-0.120	-0.122	-0.133

	(0.084)	(0.082)	(0.082)
Sport on daily basis for peers	-0.064	-0.060	-0.060
	(0.067)	(0.066)	(0.065)
Older siblings of peers smoke	0.182**	0.170**	0.143*
	(0.076)	(0.075)	(0.075)
Smoking of 3 <sup>rd</sup> year students	0.079	0.088	0.098
	(0.063)	(0.061)	(0.060)
Last drinking in a pub		0.047**	0.108***
		(0.022)	(0.013)
Constant	0.222**	0.226**	0.212*
	(0.113)	(0.112)	(0.110)
<i>N</i>	2956	2956	2956
<i>R</i> <sup>2</sup>	0.127	0.146	0.145

The dependent variable is a dummy for being a daily smoker (1 = smoker, 0 = non-smoker).  
Standard errors in parentheses, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.10. - Fixed entry age to secondary school of 14 years - Males, restricted sample (no pre-secondary school daily smokers)

	(1)	(2)	(3)	(4)	(5)	(6)
<b>% current daily smokers</b>	<b>0.412***</b>					
	<b>(0.060)</b>					
<b>% pre-school daily smokers</b>		<b>0.394***</b>	<b>0.331***</b>	<b>0.182*</b>	<b>0.172</b>	<b>0.189</b>
		<b>(0.110)</b>	<b>(0.106)</b>	<b>(0.105)</b>	<b>(0.111)</b>	<b>(0.124)</b>
Complete family	-0.071***	-0.074***	-0.067***	-0.064***	-0.056***	-0.060***
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.021)
GPA12	-0.164***	-0.186***	-0.158***	-0.140**	-0.138**	-0.166**
	(0.058)	(0.057)	(0.055)	(0.054)	(0.056)	(0.065)
GPA34	-0.098*	-0.112*	-0.088	-0.077	-0.071	-0.090

	(0.058)	(0.057)	(0.055)	(0.055)	(0.057)	(0.064)
GPA56	0.029	0.020	0.033	0.042	0.051	0.024
	(0.062)	(0.062)	(0.061)	(0.059)	(0.061)	(0.069)
Year 2003	-0.014	-0.035*	-0.038**	-0.017	-0.008	-0.003
	(0.014)	(0.018)	(0.017)	(0.019)	(0.020)	(0.024)
Father's hs degree	0.003	0.006	0.009	0.008	0.009	0.001
	(0.017)	(0.018)	(0.018)	(0.017)	(0.018)	(0.020)
Father's college degree	0.031	0.026	0.026	0.031	0.038*	0.027
	(0.019)	(0.019)	(0.020)	(0.019)	(0.020)	(0.026)
Older Sibling Smokes	0.114***	0.121***	0.110***	0.106***	0.105***	0.108***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.019)
Sport on daily basis	-0.060***	-0.063***	-0.060***	-0.058***	-0.049***	-0.056***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.018)
Vocational school	0.036**	0.060***	0.061***	-0.006	-0.013	-0.023
	(0.017)	(0.021)	(0.020)	(0.026)	(0.027)	(0.027)
Apprenticeship	0.063**	0.129***	0.129***	0.032	0.013	
	(0.025)	(0.026)	(0.026)	(0.034)	(0.037)	
Regions:						
Prague	-0.032	-0.037	-0.040	-0.023	-0.041	-0.059
	(0.023)	(0.030)	(0.029)	(0.033)	(0.032)	(0.040)
Central	-0.053**	-0.051	-0.053	-0.045	-0.033	-0.051
	(0.024)	(0.034)	(0.033)	(0.031)	(0.031)	(0.040)
South	0.002	-0.003	0.007	0.011	0.004	-0.025
	(0.033)	(0.042)	(0.039)	(0.039)	(0.043)	(0.051)
West	-0.032	-0.025	-0.039	-0.048	-0.057*	-0.093**
	(0.028)	(0.035)	(0.035)	(0.030)	(0.031)	(0.037)
North	-0.009	-0.018	-0.023	-0.028	-0.034	-0.048
	(0.024)	(0.029)	(0.028)	(0.027)	(0.028)	(0.035)
East	-0.017	-0.023	-0.024	-0.018	-0.029	-0.031
	(0.021)	(0.028)	(0.028)	(0.026)	(0.026)	(0.032)
Southeast	-0.010	-0.018	-0.023	-0.001	-0.010	-0.024
	(0.021)	(0.027)	(0.026)	(0.026)	(0.027)	(0.033)
Drunk before sec. sch.			0.079***	0.076***	0.072***	0.059**
			(0.022)	(0.022)	(0.022)	(0.026)

Beer before sec. sch.		0.033**	0.036**	0.036**	0.040**
		(0.015)	(0.015)	(0.015)	(0.019)
Try cig. before sec. sch.		0.072***	0.069***	0.068***	0.071***
		(0.015)	(0.015)	(0.016)	(0.019)
Try marijuana bef. sec. sch.		0.263***	0.257***	0.263***	0.322***
		(0.052)	(0.052)	(0.053)	(0.062)
Father's college deg. of peers			-0.196**	-0.176**	-0.215*
			(0.076)	(0.078)	(0.113)
Father's hs deg. of peers			0.070	0.110	0.119
			(0.080)	(0.082)	(0.092)
Complete family of peers			-0.129*	-0.091	-0.079
			(0.078)	(0.082)	(0.089)
Sport on daily basis for peers			-0.048	-0.056	-0.112
			(0.068)	(0.068)	(0.088)
Older siblings of peers smoke			0.267***	0.219***	0.173*
			(0.075)	(0.078)	(0.090)
Smoking of 3 <sup>rd</sup> year students				0.139**	0.140*
				(0.067)	(0.077)
Constant	0.270***	0.343***	0.255***	0.357***	0.278**
	(0.061)	(0.060)	(0.060)	(0.110)	(0.117)
<i>N</i>	3630	3630	3541	3541	3341
<i>R</i> <sup>2</sup>	0.112	0.101	0.130	0.141	0.143
					0.119

The dependent variable is a dummy for being a daily smoker (1 = smoker, 0 = non-smoker).  
Standard errors in parentheses, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.11 - Fixed entry age to secondary school of 14 years - Females, restricted sample (no pre-secondary school daily smokers)

	(1)	(2)	(3)	(4)	(5)	(6)
<b>% current daily smokers</b>	<b>0.297***</b>					
	<b>(0.058)</b>					
<b>% pre-school daily smokers</b>		<b>0.229**</b>	<b>0.215**</b>	<b>0.162*</b>	<b>0.143</b>	<b>0.110</b>



Complete family	-0.068 <sup>***</sup> (0.016)	<b>(0.100)</b> -0.071 <sup>***</sup> (0.017)	<b>(0.095)</b> -0.055 <sup>***</sup> (0.017)	<b>(0.097)</b> -0.054 <sup>***</sup> (0.017)	<b>(0.101)</b> -0.051 <sup>***</sup> (0.017)	<b>(0.118)</b> -0.059 <sup>***</sup> (0.022)
GPA12	-0.156 <sup>***</sup> (0.042)	-0.162 <sup>***</sup> (0.043)	-0.157 <sup>***</sup> (0.042)	-0.154 <sup>***</sup> (0.042)	-0.160 <sup>***</sup> (0.043)	-0.156 <sup>***</sup> (0.052)
GPA34	-0.059 (0.041)	-0.060 (0.042)	-0.073 <sup>*</sup> (0.040)	-0.072 <sup>*</sup> (0.040)	-0.080 <sup>*</sup> (0.042)	-0.080 (0.050)
GPA56	0.076 (0.053)	0.078 (0.053)	0.078 (0.052)	0.078 (0.051)	0.075 (0.053)	0.072 (0.062)
Year 2003	-0.039 <sup>***</sup> (0.012)	-0.053 <sup>***</sup> (0.015)	-0.071 <sup>***</sup> (0.014)	-0.068 <sup>***</sup> (0.017)	-0.059 <sup>***</sup> (0.017)	-0.053 <sup>***</sup> (0.023)
Father's hs degree	0.004 (0.015)	0.003 (0.015)	-0.001 (0.015)	0.000 (0.015)	-0.003 (0.015)	-0.020 (0.018)
Father's college degree	0.012 (0.017)	0.007 (0.018)	0.005 (0.018)	0.009 (0.018)	0.002 (0.018)	-0.010 (0.027)
Older Sibling Smokes	0.119 <sup>***</sup> (0.016)	0.121 <sup>***</sup> (0.016)	0.095 <sup>***</sup> (0.015)	0.094 <sup>***</sup> (0.015)	0.091 <sup>***</sup> (0.016)	0.100 <sup>***</sup> (0.019)
Sport on daily basis	-0.068 <sup>***</sup> (0.015)	-0.070 <sup>***</sup> (0.015)	-0.068 <sup>***</sup> (0.015)	-0.066 <sup>***</sup> (0.015)	-0.062 <sup>***</sup> (0.015)	-0.080 <sup>***</sup> (0.021)
Vocational school	0.017 (0.017)	0.041 <sup>**</sup> (0.017)	0.035 <sup>**</sup> (0.017)	0.004 (0.025)	-0.006 (0.022)	-0.079 <sup>***</sup> (0.026)
Apprenticeship	0.097 <sup>***</sup> (0.026)	0.165 <sup>***</sup> (0.023)	0.159 <sup>***</sup> (0.022)	0.105 <sup>***</sup> (0.035)	0.082 <sup>**</sup> (0.034)	
Regions:						
Prague	-0.010 (0.024)	-0.006 (0.027)	-0.028 (0.026)	-0.028 (0.028)	-0.048 (0.030)	-0.024 (0.035)
Central	0.044 <sup>*</sup> (0.024)	0.055 <sup>*</sup> (0.029)	0.046 (0.028)	0.040 (0.029)	0.051 (0.032)	0.050 (0.039)
South	-0.021 (0.018)	-0.020 (0.023)	-0.030 (0.022)	-0.026 (0.023)	-0.018 (0.023)	-0.037 (0.031)
West	0.035 (0.028)	0.039 (0.033)	0.020 (0.034)	0.019 (0.034)	0.020 (0.033)	0.005 (0.046)
North	-0.028 (0.021)	-0.021 (0.025)	-0.030 (0.025)	-0.038 (0.025)	-0.035 (0.026)	-0.034 (0.032)

East	-0.026 (0.020)	-0.031 (0.024)	-0.037 (0.023)	-0.036 (0.024)	-0.044** (0.022)	-0.043 (0.029)
Southeast	0.013 (0.018)	0.014 (0.022)	0.003 (0.022)	0.009 (0.021)	0.011 (0.021)	0.013 (0.026)
Drunk before sec. sch.			0.134*** (0.026)	0.132*** (0.026)	0.137*** (0.026)	0.156*** (0.032)
Beer before sec. sch.			0.016 (0.012)	0.017 (0.012)	0.016 (0.012)	0.022 (0.016)
Try cig. before sec. sch.			0.114*** (0.015)	0.115*** (0.014)	0.111*** (0.015)	0.120*** (0.018)
Try marijuana bef. sec. sch.			0.271*** (0.049)	0.270*** (0.049)	0.263*** (0.049)	0.216*** (0.052)
Father's college deg. of peers				-0.061 (0.065)	-0.026 (0.059)	0.016 (0.098)
Father's hs deg. of peers				0.002 (0.065)	0.040 (0.067)	0.014 (0.083)
Complete family of peers				-0.169** (0.072)	-0.201*** (0.074)	-0.162* (0.083)
Sport on daily basis for peers				-0.053 (0.060)	-0.029 (0.059)	-0.095 (0.086)
Older siblings of peers smoke				0.050 (0.063)	0.056 (0.062)	0.043 (0.080)
Smoking of 3 <sup>rd</sup> year students					0.114* (0.068)	0.147* (0.082)
Constant	0.269*** (0.049)	0.313*** (0.051)	0.264*** (0.049)	0.431*** (0.096)	0.408*** (0.096)	0.471*** (0.114)
<i>N</i>	4193	4193	4087	4087	3882	2713
<i>R</i> <sup>2</sup>	0.132	0.126	0.178	0.180	0.185	0.162

The dependent variable is a dummy for being a daily smoker (1 = smoker, 0 = non-smoker).  
Standard errors in parentheses, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

TableA.12 - Entry age to secondary school defined as age 7 months prior to survey - Males, restricted sample (no pre-secondary school daily smokers)

	(1)	(2)	(3)	(4)	(5)	(6)
<b>% current daily smokers</b>	<b>0.348<sup>***</sup></b> <b>(0.058)</b>					
<b>% pre-school daily smokers</b>		<b>0.350<sup>***</sup></b> <b>(0.077)</b>	<b>0.321<sup>***</sup></b> <b>(0.077)</b>	<b>0.206<sup>***</sup></b> <b>(0.076)</b>	<b>0.213<sup>***</sup></b> <b>(0.075)</b>	<b>0.234<sup>***</sup></b> <b>(0.090)</b>
Complete family	-0.067 <sup>***</sup> (0.018)	-0.067 <sup>***</sup> (0.018)	-0.059 <sup>***</sup> (0.018)	-0.056 <sup>***</sup> (0.018)	-0.045 <sup>**</sup> (0.018)	-0.045 <sup>**</sup> (0.022)
GPA12	-0.095 <sup>*</sup> (0.057)	-0.114 <sup>**</sup> (0.056)	-0.098 <sup>*</sup> (0.053)	-0.085 (0.052)	-0.072 (0.054)	-0.114 <sup>*</sup> (0.062)
GPA34	-0.057 (0.057)	-0.074 (0.056)	-0.063 (0.053)	-0.052 (0.052)	-0.040 (0.053)	-0.072 (0.062)
GPA56	0.011 (0.061)	-0.002 (0.060)	0.006 (0.058)	0.015 (0.056)	0.035 (0.058)	-0.003 (0.066)
Year 2003	-0.020 (0.014)	-0.036 <sup>**</sup> (0.015)	-0.041 <sup>***</sup> (0.015)	-0.033 <sup>*</sup> (0.018)	-0.023 (0.018)	-0.031 (0.022)
Father's hs degree	0.008 (0.017)	0.009 (0.017)	0.008 (0.017)	0.008 (0.017)	0.012 (0.018)	0.004 (0.020)
Father's college degree	0.022 (0.018)	0.018 (0.018)	0.016 (0.019)	0.020 (0.018)	0.028 (0.019)	0.034 (0.025)
Older Sibling Smokes	0.108 <sup>***</sup> (0.017)	0.112 <sup>***</sup> (0.017)	0.097 <sup>***</sup> (0.017)	0.094 <sup>***</sup> (0.017)	0.096 <sup>***</sup> (0.017)	0.104 <sup>***</sup> (0.020)
Sport on daily basis	-0.045 <sup>***</sup> (0.013)	-0.046 <sup>***</sup> (0.013)	-0.047 <sup>***</sup> (0.013)	-0.045 <sup>***</sup> (0.013)	-0.039 <sup>***</sup> (0.013)	-0.045 <sup>***</sup> (0.017)
Vocational school	0.022 (0.017)	0.026 (0.020)	0.029 (0.019)	0.001 (0.025)	0.002 (0.026)	-0.030 (0.024)
Apprenticeship	0.055 <sup>**</sup> (0.024)	0.084 <sup>***</sup> (0.025)	0.090 <sup>***</sup> (0.025)	0.043 (0.032)	0.032 (0.034)	
Regions:						

Prague	-0.012 (0.023)	-0.017 (0.028)	-0.017 (0.027)	-0.020 (0.031)	-0.031 (0.032)	-0.051 (0.040)
Central	-0.028 (0.023)	-0.022 (0.028)	-0.024 (0.028)	-0.024 (0.028)	-0.016 (0.030)	-0.032 (0.038)
South	0.008 (0.035)	0.014 (0.044)	0.023 (0.042)	0.016 (0.042)	-0.004 (0.041)	-0.031 (0.052)
West	-0.009 (0.025)	-0.006 (0.028)	-0.020 (0.027)	-0.028 (0.025)	-0.035 (0.025)	-0.047 (0.032)
North	0.009 (0.023)	0.010 (0.026)	0.006 (0.026)	-0.007 (0.026)	-0.010 (0.027)	-0.015 (0.033)
East	0.001 (0.022)	-0.008 (0.026)	-0.005 (0.026)	-0.004 (0.025)	-0.014 (0.026)	-0.020 (0.033)
Southeast	0.013 (0.019)	0.005 (0.023)	-0.001 (0.023)	0.009 (0.023)	0.004 (0.024)	-0.010 (0.030)
Drunk before sec. sch.			0.034** (0.017)	0.034** (0.016)	0.037** (0.017)	0.036* (0.020)
Beer before sec. sch.			0.007 (0.016)	0.011 (0.016)	0.005 (0.016)	0.001 (0.021)
Try cig. before sec. sch.			0.062*** (0.014)	0.061*** (0.014)	0.065*** (0.015)	0.086*** (0.018)
Try marijuana bef. sec. sch.			0.183*** (0.030)	0.181*** (0.030)	0.170*** (0.030)	0.169*** (0.036)
Father's college deg. of peers				-0.078 (0.071)	-0.060 (0.072)	-0.021 (0.106)
Father's hs deg. of peers				0.044 (0.072)	0.061 (0.075)	0.074 (0.087)
Complete family of peers				-0.131* (0.076)	-0.081 (0.080)	-0.068 (0.087)
Sport on daily basis for peers				-0.088 (0.060)	-0.101* (0.059)	-0.152* (0.077)
Older siblings of peers smoke				0.207*** (0.071)	0.155** (0.072)	0.121 (0.084)
Smoking of 3 <sup>rd</sup> year students					0.097 (0.062)	0.111 (0.072)

Constant	0.172 <sup>***</sup> (0.060)	0.209 <sup>***</sup> (0.059)	0.132 <sup>**</sup> (0.058)	0.238 <sup>**</sup> (0.101)	0.153 (0.107)	0.223 <sup>*</sup> (0.119)
<i>N</i>	3163	3163	3082	3082	2906	2213
<i>R</i> <sup>2</sup>	0.088	0.084	0.120	0.127	0.126	0.105

The dependent variable is a dummy for being a daily smoker (1 = smoker, 0 = non-smoker).

Standard errors in parentheses, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.12 - Entry age to secondary school defined as age 7 months prior to survey - Females, restricted sample (no pre-secondary school daily smokers)

	(1)	(2)	(3)	(4)	(5)	(6)
<b>% current daily smokers</b>	<b>0.217<sup>***</sup></b> <b>(0.058)</b>					
<b>% pre-school daily smokers</b>		<b>0.109<sup>*</sup></b> <b>(0.061)</b>	<b>0.084</b> <b>(0.063)</b>	<b>0.037</b> <b>(0.065)</b>	<b>0.027</b> <b>(0.066)</b>	<b>0.012</b> <b>(0.081)</b>
Complete family	-0.050 <sup>***</sup> (0.015)	-0.052 <sup>***</sup> (0.015)	-0.034 <sup>**</sup> (0.016)	-0.033 <sup>**</sup> (0.016)	-0.027 <sup>*</sup> (0.016)	-0.033 (0.021)
GPA12	-0.095 <sup>**</sup> (0.043)	-0.099 <sup>**</sup> (0.044)	-0.106 <sup>**</sup> (0.043)	-0.104 <sup>**</sup> (0.043)	-0.108 <sup>**</sup> (0.045)	-0.121 <sup>**</sup> (0.055)
GPA34	-0.025 (0.042)	-0.026 (0.043)	-0.047 (0.042)	-0.046 (0.043)	-0.051 (0.044)	-0.070 (0.054)
GPA56	0.106 <sup>*</sup> (0.060)	0.108 <sup>*</sup> (0.060)	0.101 <sup>*</sup> (0.058)	0.100 <sup>*</sup> (0.058)	0.096 (0.060)	0.080 (0.071)
Year 2003	-0.047 <sup>***</sup> (0.012)	-0.057 <sup>***</sup> (0.013)	-0.072 <sup>***</sup> (0.013)	-0.061 <sup>***</sup> (0.016)	-0.053 <sup>***</sup> (0.016)	-0.059 <sup>***</sup> (0.021)
Father's hs degree	-0.010 (0.013)	-0.010 (0.013)	-0.018 (0.013)	-0.017 (0.013)	-0.021 (0.014)	-0.038 <sup>**</sup> (0.017)
Father's college degree	0.001 (0.016)	-0.002 (0.016)	-0.010 (0.015)	-0.006 (0.015)	-0.014 (0.016)	-0.032 (0.022)
Older Sibling Smokes	0.087 <sup>***</sup> (0.016)	0.088 <sup>***</sup> (0.016)	0.065 <sup>***</sup> (0.015)	0.064 <sup>***</sup> (0.015)	0.061 <sup>***</sup> (0.016)	0.077 <sup>***</sup> (0.020)

Sport on daily basis	-0.048 <sup>***</sup> (0.014)	-0.049 <sup>***</sup> (0.014)	-0.050 <sup>***</sup> (0.013)	-0.048 <sup>***</sup> (0.013)	-0.047 <sup>***</sup> (0.014)	-0.055 <sup>***</sup> (0.019)
Vocational school	0.012 (0.017)	0.026 (0.017)	0.016 (0.017)	-0.011 (0.023)	-0.020 (0.020)	-0.047 <sup>*</sup> (0.025)
Apprenticeship	0.054 <sup>**</sup> (0.027)	0.099 <sup>***</sup> (0.024)	0.094 <sup>***</sup> (0.024)	0.057 <sup>*</sup> (0.032)	0.042 (0.031)	
Regions:						
Prague	-0.026 (0.022)	-0.024 (0.024)	-0.034 (0.024)	-0.031 (0.026)	-0.050 <sup>*</sup> (0.028)	-0.020 (0.032)
Central	0.041 <sup>*</sup> (0.025)	0.048 <sup>*</sup> (0.028)	0.039 (0.028)	0.035 (0.028)	0.053 <sup>*</sup> (0.030)	0.051 (0.036)
South	-0.032 (0.020)	-0.034 (0.022)	-0.043 <sup>**</sup> (0.021)	-0.041 <sup>*</sup> (0.023)	-0.032 (0.023)	-0.045 (0.033)
West	0.029 (0.030)	0.033 (0.033)	0.021 (0.033)	0.020 (0.032)	0.027 (0.030)	0.017 (0.040)
North	-0.031 (0.021)	-0.027 (0.023)	-0.032 (0.023)	-0.038 (0.024)	-0.038 (0.025)	-0.036 (0.032)
East	-0.016 (0.018)	-0.023 (0.020)	-0.031 (0.020)	-0.033 (0.020)	-0.034 <sup>*</sup> (0.018)	-0.036 (0.024)
Southeast	0.018 (0.019)	0.020 (0.022)	0.014 (0.021)	0.018 (0.021)	0.025 (0.020)	0.032 (0.026)
Drunk before sec. sch.			0.077 <sup>***</sup> (0.018)	0.078 <sup>***</sup> (0.018)	0.078 <sup>***</sup> (0.018)	0.096 <sup>***</sup> (0.022)
Beer before sec. sch.			0.016 (0.013)	0.017 (0.013)	0.017 (0.013)	0.003 (0.017)
Try cig. before sec. sch.			0.081 <sup>***</sup> (0.013)	0.082 <sup>***</sup> (0.013)	0.081 <sup>***</sup> (0.014)	0.089 <sup>***</sup> (0.018)
Try marijuana bef. sec. sch.			0.174 <sup>***</sup> (0.035)	0.175 <sup>***</sup> (0.035)	0.168 <sup>***</sup> (0.036)	0.201 <sup>***</sup> (0.043)
Father's college deg. of peers				-0.057 (0.059)	-0.022 (0.055)	0.011 (0.086)
Father's hs deg. of peers				0.053 (0.063)	0.095 (0.065)	0.072 (0.080)
Complete family of peers				-0.123 <sup>*</sup>	-0.167 <sup>**</sup>	-0.155 <sup>**</sup>

				(0.067)	(0.068)	(0.076)
Sport on daily basis for peers				-0.035	-0.008	-0.049
				(0.057)	(0.055)	(0.079)
Older siblings of peers smoke				0.058	0.076	0.087
				(0.061)	(0.058)	(0.074)
Smoking of 3 <sup>rd</sup> year students					0.074	0.108
					(0.063)	(0.074)
Constant	0.197 <sup>***</sup>	0.225 <sup>***</sup>	0.176 <sup>***</sup>	0.277 <sup>***</sup>	0.261 <sup>***</sup>	0.306 <sup>***</sup>
	(0.049)	(0.050)	(0.049)	(0.087)	(0.090)	(0.108)
<i>N</i>	3646	3646	3548	3548	3368	2280
<i>R</i> <sup>2</sup>	0.092	0.088	0.138	0.140	0.143	0.138

The dependent variable is a dummy for being a daily smoker (1 = smoker, 0 = non-smoker).

Standard errors in parentheses, \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$