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Environmental, non-specific factors affecting legal and illegal drug consumption

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Abstract

The threat of psychotropic substances has been rising significantly in Hungary. Serious health problems arise not only from illicit drug use but also from tobacco and alcohol consumption. Although genetic predisposition determines the progress from recreational use to addiction, environmental factors are equally important. To find the best way of intervention, environmental factors should be taken into account. We studied the effect of environmental and demographic factors on illicit and legal drug consumption in a population reached via homepages and social media sites, using a questionnaire, filled out mainly by students and also reaching their relatives and acquaintances. Cannabis was the most frequently used illicit drug, and the usage of legal and illicit drugs correlated. Anti-smoking campaigns had not yet diminished the number of smokers, who were equally present in each age group, among wealthy and poor, both in rural or urban areas. Alcohol consumption was independent of wealth but not of the place of residence or education level, while drug consumption corresponded with the place of residence. Alcohol and drug, especially cannabis consumption are higher in urban than in rural areas. The majority of those who never tried them are just above the poverty line or have an average income. In conclusion, to increase the effectiveness of prevention programs the focus of National Anti-Drug Strategy 2013-20, should be broadened to include problems of both illicit and legal drug uses equally in different socioeconomic environments.

Keywords: illicit drug; legal drug; environmental factors;

1. Introduction

Substances such as alcohol, nicotine, and illicit drugs affect the reward circuitry of the brain, and their long-term, heavy use can permanently change its structure and function (Volkov and Li, 2005). Therefore, addiction is a brain disease, and as many other health conditions, it is associated with genetic and environmental risk factors as well. Genetic predisposition accounts for 51-75% of addictions, and determines the progress from substance use to addiction, while psychological

and environmental factors influence whether individuals start to use substances and what substances they choose (Cox et al., 2017). Environmental factors include access and exposure to substances of abuse, neighborhood disadvantage and disorder, and environmental barriers to treatment (Mennis et al., 2016). Since the threat by psychotropic substances had been rising significantly in countries around the world, and the problem of youth drug abuse significantly increased during the last decades, substance use disorders are recognized as one of the most pressing global public health problems (Hall et al., 2016). Legal drugs like tobacco and alcohol are frequently used substances in Hungary. Smoking is the biggest cause of preventable death in the European Union, especially in Eastern European Countries (EU Open Data Portal, 2015). In Hungary, the prevalence of smoking slightly decreased during the last 10 years, but it is still very high, 26.6% of Hungarians smoke daily (EU Open Data Portal, 2015). The proportion of heavy smokers (more than 20 cigarettes a day) among men is 25.8%, one of the highest in the European Union, thus it is not surprising, that more than 20 000 people died as a direct result of smoking in 2012 (CDC, 2017). As to alcohol consumption, it is very difficult to estimate the number of people who are addicted in Hungary. In point of alcohol consumption, 48 percent of 17-year-old students drank alcohol and 35 percent was drunk in the last 30 days. The presence of binge drinking is an existing feature in Hungary. This becomes clear, if we examine students between 14 and 16, 50 percent of whom was drunk at least once in their life (Elekes, 2007). The situation is much worse if we examine the data of alcohol-specific mortality. It has been one of the most frequent mortality rate cause for a long time. The number of these cases are twice higher in Hungary than in the European Union. The alcohol-caused mortality increased until 1993 after it decreased until 2005, then it increased again, more slowly than during the ‘90s. Generally, we can say that Hungary is one of the leading countries in alcohol-caused mortality (Elekes, 2014). Data on the consumption of illegal drugs in Hungary are similar to the European ones. The most frequently used drugs were marijuana and hashish in 2011 (Drogfókuszpont, 2012). Almost 10 % of inhabitants between 18 and 64 have tried some kind of illicit drug. 7.4 % of this population has tried the above mentioned forms of Cannabis. In 2016, 29 people’s death was caused by drug overdose (Country Drug Report, Hungary, 2018). The prevalence of illicit drugs increased from 1995 to 2003. After 2003 there was a short period when drug consumption dropped, but from 2007 it kept on the increase until 2011 (Drogfókuszpont, 2012).

1.1. Social and environmental effects on alcohol drinking

Cox and Klinger (1988) have proposed a motivational model of alcohol use. The drinker can exercise control over the decision to drink, or not do so, but several variables might increase the

value of drinking, thus a weight will be added to this person's decisions to drink. The society in which the person lives determine the value that a person attributes to drinking alcohol, and also define the circumstances in which it is appropriate to drink and how much alcohol should they drink (Orford, 2001, Room, 2013, Wild, 2002). People whose drinking habit matches the expectation of their environment are rewarded for their behavior (Cox et al., 2017). In Hungary, alcohol consumption is generally accepted at family or religious celebrations, like birthdays, Christmas, parties, etc. Society is extremely tolerant of alcohol drinking and being drunken. People think that being drunken is acceptable if they have problems in their private life or workplace (Elekes, 2014). Drinking alcohol is also regarded as a criterion of masculinity.

1.2. Environmental determinants of tobacco use

Nicotine in tobacco is a highly addictive substance and there is no doubt that nicotine addiction sustains tobacco use in most cases (Dunn, 1972). Individual response to tobacco varies among individuals and this variation mainly depends on biological factors. However, variations of tobacco use among countries and regions of a country cannot be fully explained by biological differences (Cummings et al., 2009), tobacco use at a population level is the product of the interaction of agent (product design and marketing), host (consumers), and environmental factors (social acceptance, availability) (Cummings, 2002, Cummings et al., 2009). A social environment where smoking is supported helps expressing innate genetic profile, and makes people more susceptible to nicotine dependency, while increased governmental actions to regulate the use, sale, and advertising of tobacco products, such as prohibiting smoking in most public and workplaces, contributed to the social marginalization of smoking as an accepted behavior (Hyland et al. 2009). In Hungary, smoking is prohibited in all public places, schools, the law is one of the strictest in Europe, but these rules did not make the situation better yet. Nowadays, we can find that the environment less tolerant, many people have a hard, negative opinion about smoking. Tobacco can be bought only by adults in special shops but young people still claim that buying these products is easy or very easy (Elekes, 2014). It is not difficult to notice that this provision is not effective enough. Successful control of tobacco use only gained when a multidimensional approach is used combining of educational, clinical, and social strategies (CDC, 2017) helping the prevention as well as the cessation of tobacco use.

1.3. Cannabis and other illicit drug use

Cannabis is the most widely used illicit substance, although the use of psychostimulants is also quite common in most countries. Since most of the drug users do not access drug treatment services, the consequences of their drug use are mainly unclear. Heavy drug use may cause

physical health problems, but illicit drugs, particularly cannabis, could cause psychological and social problems as well (Hall and Solowij 1998). A causal relation between drug use and psychosocial harm could plausibly be provoked by two principal mechanisms: directly, through neurophysiological pathways, or indirectly, through involvement in the criminal culture and commerce associated with the use of an illegal substance (Lenton, 2001, Macleod et al., 2004). In Hungary, ordering anything from the internet is a legal activity. Many websites offer "fumigants" or "pot-pourries". These products seem to be innocent but in reality, they are illicit drugs. It is almost impossible to detect and punish these companies because if somebody orders fumigants to scent his or her house, it is a legal action. Drug trafficking via internet sites increased the availability of illicit drugs, and at the same time caused a number of drug-related problems: among others psychosomatic problems and marginalization.

1.4. Environmental factors in health development and drug prevention programs

Countries around the world have introduced numerous treatment approaches to address the need of drug abusers. Since several studies concluded that specific and non-specific factors in addiction treatment are equally important (Miller and Moyers, 2015), treatment and rehabilitation services focus on environmental factors as well as preventing relapse, introducing approaches that help to develop a lifestyle and environment securing improvement. These services include residential care and intensive inpatient services, community-based outpatient and day treatments, behavioral therapy, family therapy and outreach programs to mention some of them. Apart from the treatment and rehabilitation of abusers, national drug strategies define other areas of intervention as well, most strategies focus on prevention and the determination of risky substance use environments. Researchers aim to find the implications of environmental inequities for disparities in substance use disorders and treatment outcomes (Mennis et al., 2016). Environmental prevention policies and interventions seek to provide a stimulus that evokes healthier decisions: peers, friends and the working environment can be just as instrumental to an addict's recovery as they can be to a drug problem (Tracy and Wallace, 2016). Environmental management strategies also aim to limit availability, restrict marketing, moreover offer alcohol-free social and public service options as well as the health-promoting environment (EMCDDA, 2018). Detailed knowledge about the environment within which the drug is consumed, helps to form directives that are approved by the users and therefore viewed as an opportunity to either quit altogether or to reduce consumption (Cummings et al., 2009). In Hungary, the National Core Curriculum, and in the Frame Curricula contain a complex health educational program for public schools. They describe the responsibility and tasks of the schools to prevent addiction to legal and illegal drugs. Every school has to make

a local curriculum, which helps to avoid behavioral attitudes that lead to health damage. In practice, the usual methods of this work are presentations or lectures, given by teachers, police officers or health visitors. These lectures mainly display different kinds of drugs and direct attention to the dangers of consuming drugs.

1.5. The aim of the study

We studied the effect of environmental and demographic factors on illicit and legal drug consumption in a population that consisted of mainly university students, using a questionnaire with 25 multiple choice items. We believe that the targeted population represents a financially consolidated, well-educated group, aged mainly between 19-25 years. Therefore, both legal and illicit drug use choices showed low levels of consumptions: non-users (never used the substance), experiencers (tried 1-5 times) occasional consumers (lifetime use 31-100 times or persons used a substance occasionally once in their life: 6-30 times) and experienced consumers (>100 times). Participation was voluntary and the online questionnaire was filled anonymously.

2. Method

The questionnaire was distributed via the homepage of teachers of the Eszterházy Károly University, also using their social media sites. It consists of multiple choice items regarding the environmental factors (education level, place of residence, financial situation) of the participants and the amount of legal or illegal drugs they consumed during their life and the last 30 days. Self-reports of different drug uses were pooled and the total drug consumption was calculated. Participants also filled in the following general information: gender, age, occupation: selected from the built-in list of the internet site we used to prepare our questionnaire (http://www.kerdoivem.hu). Data were analyzed using the R statistical environment (2018). Spearman rank correlation coefficients were used to assess monotonic relations between tobacco, alcohol and illicit drug consumption. Possible connections between substance use and several different environmental and demographic factors were analyzed using the χ^2 test of independence. Data of participants below 14 years were omitted.

3. Results and implications

The net sample size was 756, (191 male), participants were between ages 14 and 77, the majority of them aged between 18 and 25 years (62.4%). Taking their financial situation, place of residence and education into account the majority of the participants have enough income to cover his/her expenses (65.6%) or have financial problems only at unexpected circumstances (26.1%), live in

villages (39.8%) or smaller towns (38.8/), and they are either students (35.7%) or already have a university degree (30.0%).

The incidence of tobacco use was the highest, as only 18.7% never smoked a cigarette, 38.5% smoked more than 100 cigarettes in his/her life, and 21.5% had more than 30 cigarettes during the last 30 days. Although only 4.5% of the participants never drank alcohol (at least one alcohol unit) but from the 37.1% who consumed more than 100 alcohol units during his/her life only 2.5% drunk more than 30 alcohol units during the last 30 days. Cannabis was the most widely used illicit substance, 32.0% of the participants used it at least once. Apart from cannabis, the illicit use of prescription medicines was considerable, 20.4% used it at least once. The incidence of the use of other drugs was below 10%, after pooling the consumption of the different drugs, 42.7% of the population used at least one of them at least once. During the last 30 days, only 14.8 used any drug, and mainly in a small amount. Although the incidence of drug use is surprisingly high, the amount of consumption is low, suggesting that an occasional recreational use of illicit drugs occurs in the studied population. A strong association was found between tobacco, alcohol, and illicit drug use. Those, who used drugs usually tried smoking and drunk alcohol as well (figure 1). Our questionnaire shows that the prevalence of smoking is lower than the national level. In regard to alcohol, the prevalence is similar to the national data, the amount of consumption seems to be moderate, although with our questionnaire we could not detect heavy binge drinkers.

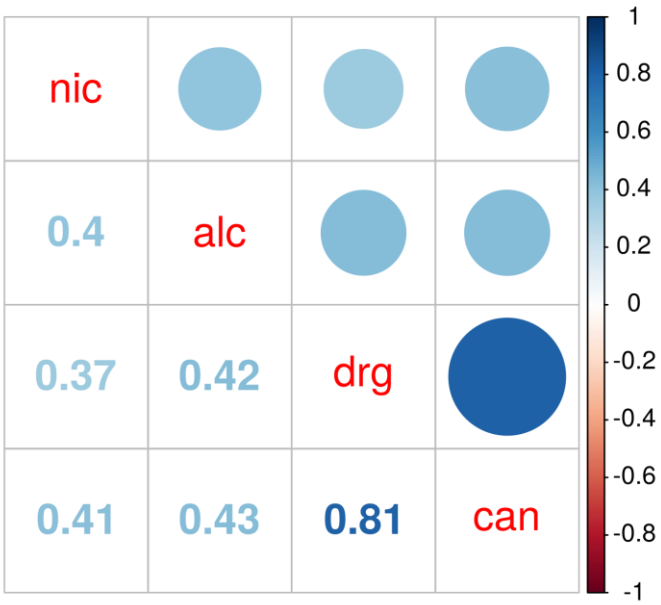

Figure 1. Correlation between legal and illicit drug use

The consumption of tobacco (nic), alcohol (alc), illicit drugs (drg) and cannabis highly correlated. Numbers show the Spearman rank correlation coefficient.

Examining illicit drug consumption shows that our data are higher than the average

national data, but the majority of the participants are aged between 18-25 years, thus represent the most vulnerable population in this respect.

3.1 Environmental effects on tobacco use

Nearly 80% of the participants experienced smoking by the age of 21 (Figure. 2), thus anti-smoking campaigns should aim primary and secondary school students. Nicotine is a highly addictive substance, so most people, who begin smoking during their teenage or university years then struggle to quit as adults, and regret having started to smoke (Fong et al., 2004). The percentage of non-smokers (who never smoked) was the lowest in the young adult population. The higher percentage of non-smokers among adults possibly reflects the fact that smoking among women started increasing recently, that is women within the older generations smoked less. None of the studied environmental factors affected tobacco use, thus the prevalence of smoking was similar in rural and urban areas. Neither did it differ among people with different financial situation or did not change with education (not shown). Recent restrictions on tobacco products marketing to children or measures to prohibit smoking in public places decreased the availability of tobacco products and the prevalence of smoking by 5% but they could not yet achieve a drastic change in attitude towards smoking.. According to the Global Youth Tobacco Survey (GYTS) Hungarian children regarded the purchase of cigarettes easy, and 14% of them believed that he or she would smoke in the next 12 months (Dohányzás Fókuszpont, 2016).

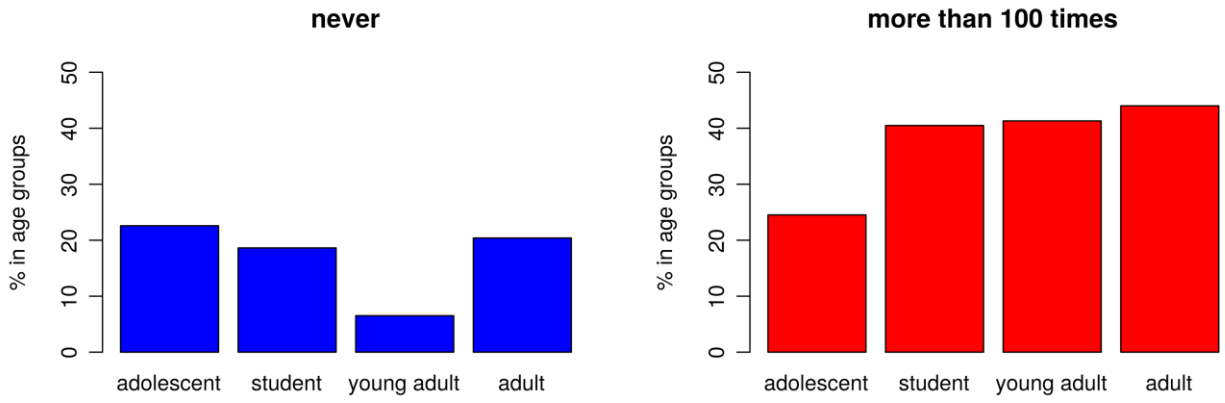

Figure 2. The percentage of non-smokers and smokers in different age groups.

The percentage of non-smokers (never) was the highest among adolescents (14-19 years old) 22.6%, and 24.5% of the adolescents already smoked more than 100 cigarettes. Around 40% of students (19-21) young adults (22-25), and adults >25 smoked more than 100 cigarettes, suggesting that the majority of people experienced smoking <21 years old.

3.2 Environmental effects on alcohol use

Hungary has always belonged to the group of nations characterized by high alcohol consumption (Elekes, 2014), and it is nearly impossible to attend any formal or informal gathering without being offered a drink (Grelinger, 2010), thus the small percentage of lifetime abstinence (4.7%) or no consumption during the last 30 days (23.9%) is not surprising. Since only 2.3% of the participants reported the consumption of more than 30 alcohol units during the last 30 days, we can assume that the studied population is a moderate or occasional drinker. According to Lukács and coworkers (Lukács et al., 2013), most students drink alcohol regularly, students and teachers usually see it as an integral part of the higher-education life. Heavy drinkers could be underrepresented in our sample, due to the fact that they do not visit their teacher's homepage or social media site or they just did not volunteer to fill out this questionnaire. The extent of binge drinking and alcohol consumption should be studied in more detail, because alcohol-related problems among university students are in a rise worldwide (Bravo et al., 2016, López-Caneda et al. 2017, White et al., 2016). The majority of the participants had no serious financial problems, only 4.2% of the participant felt that he or she was poor and/or needed financial support, and 4.1% felt that he or she was rich. Thus, it is not surprising that we did not find a connection between alcohol consumption and wealth, but interestingly those who reported financial difficulties or needed financial support and those who were wealthy regardless their age had drunk some alcohol (Figure 3). Those who never drink any alcohol mainly live in urban areas, and alcohol consumption in the capital is more moderate (fewer participants reported the consumption of more than 100 units) than anywhere else. With education, alcohol consumption tends to decrease (Figure 3). Our data suggest a tendency towards more moderate alcohol consumption at least among educated people, especially in bigger cities.

3.3 Environmental effects on drug consumptions

Although in Hungary the purchase, consumption, and possession of illegal drugs are all criminal offenses, the lifetime incidence of illicit drug use was surprisingly high in our sample (42.7%). This result suggests that despite the strict regulation, accessibility of drugs increased notably during the last decade. Drug consumption became more accepted, and the presence of drugs at parties and clubs seems to be almost normal. Drug use is not strong in our sample the lifetime use of the drug was less than 30 used for the majority of the participants who ever tried them. According to our data, students and young adults experienced illicit drugs a few times (Figure 4). Non-users lived mainly in villages and small towns, probably because rural places are still relatively less frequented by suppliers. Drug use did not depend on the level of education,

secondary school students and university students are equally likely to try some of them. In previous studies, it was shown that drug use and availability were highly correlated, and ease of availability was slightly more predictive of drug use than drug preference (Feldman et al., 2011). Also, the social composition of drug users is continuously changing as new forms of drug use are emerging (Flynn and Hoffer, 2017, Gerevich and Bácskai, 1995) thus it is rather an education that affects the choice of drug consumed than the fact that a person tries it or not. An association between different drug types and education might be detected in a larger sample. According to these results, prevention programs should be strengthened, universal prevention activities implemented mainly in the educational setting have not yet achieved the desired effects, drug-related knowledge should be improved as well as the awareness of drug-related health and social problems.

4. Conclusions

The present study shows that legal and illicit drug consumption are highly correlated. Therefore, prevention programs should equally aim at the limitation of all addictive substances. An anti-smoking behavior should be formed during primary or secondary school years because people try out smoking usually during these years. The high prevalence of illicit drug use is alarming. Although the consumption of drugs was moderate, people should be aware that the harmful effect of several drugs (especially some of the designer drugs) can already emerge after a few uses (Vearrier et al., 2012). To improve the situation and refine our knowledge, changes of attitudes and related normative beliefs, as well as changes in behavior patterns would be necessary. While the present prevention programs will help to improve the first two aspects, the required behavioral changes are not yet facilitated by the majority of presently executed school-based prevention activities.

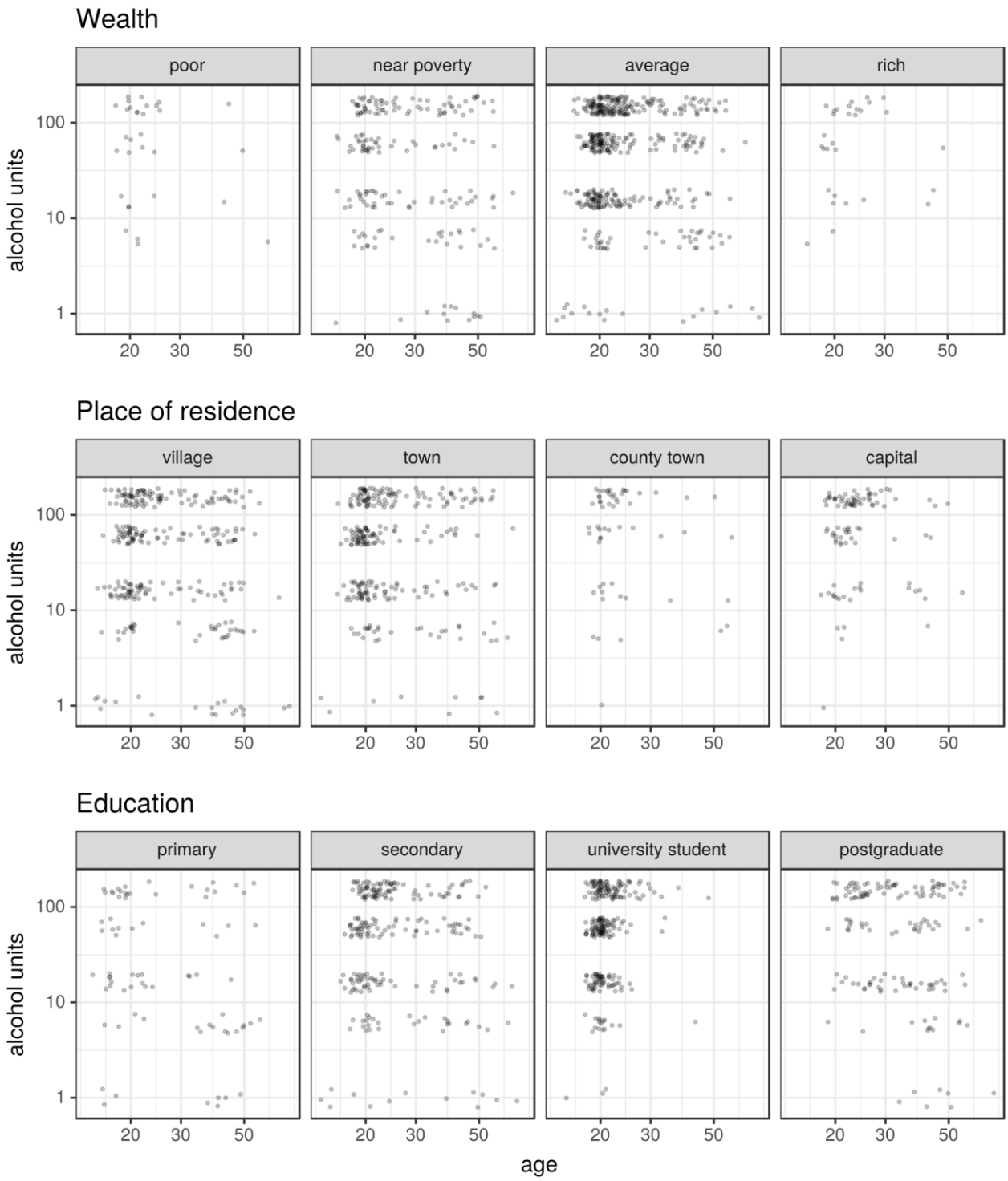

Figure 3. The effect of environmental factors on alcohol consumption

Alcohol units reflect the different levels of alcohol consumption (never=1; max 5; max 30; and above 100). Data points were jittered to avoid overlapping. Independence of alcohol units and environmental factors was checked by using $\chi 2$ test. Alcohol consumption was independent of the financial situation ($p=0.18$), while we have found a significant association between alcohol consumption and the place of residence ($p>0.05$) as well as alcohol consumption and education ($p>0.01$). Those who never drink alcohol, lived in villages and smaller towns, and there were only a few abstinents among university students.

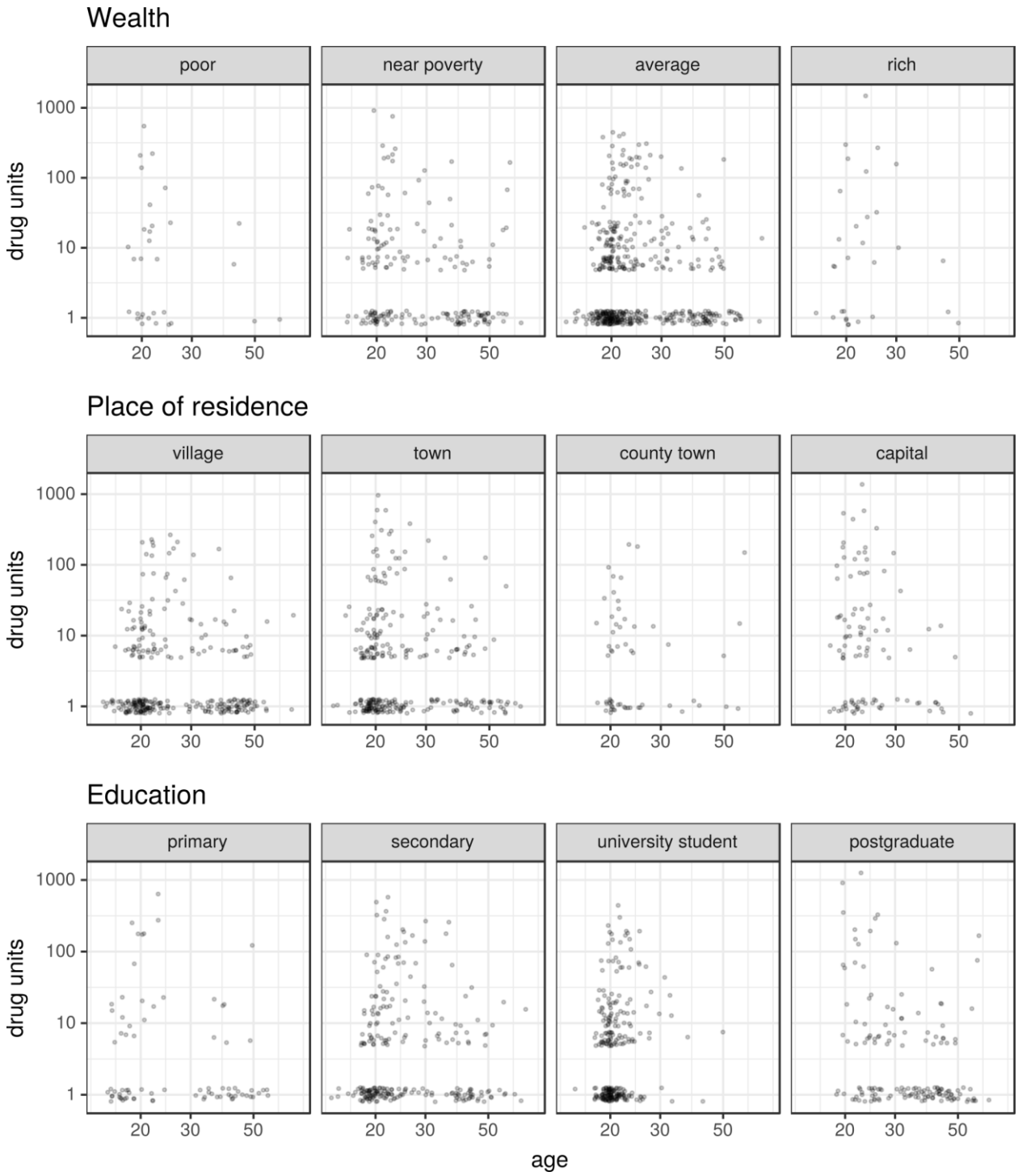

Figure 4. The effect of environmental factors on drug consumption

Drug units reflect the different levels of total drug consumption (never=1; max 5; max 30; and above 100). Data points were jittered to avoid overlapping. Independence of drug units and environmental factors was checked by using $\chi 2$ test. Drug consumption was independent of the financial situation ($p=0.28$), or education ($p=0.17$), while we have found a significant association between drug consumption and the place of residence ($p>0.01$). More participants in villages than in cities never tried any drug while more participants living in the capital than in smaller places used drugs more than 100 times.

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