

# Factors associated with the onset of drug use, polysubstance use, the frequency of drug use and combining drugs with alcohol of Dutch students



**Name:** Janine Pingen  
**Student number:** 2556518  
**Research label:** Health sciences (24 EC)  
**Organization:** Bureau studentenartsen | general practitioners oude Turfmarkt  
**Department:** Research, development and prevention  
**On site supervisors:** Claudia M. van der Heijde and Peter Vonk  
**Vu supervisor:** David Brinkman  
**Period:** Spring (6 February -2 June)



UNIVERSITEIT  
VAN AMSTERDAM



## Inhoud

Summary .....	4
Introduction.....	5
Drug classification .....	5
Reported health incidences.....	5
Drug harms .....	6
Theoretical framework.....	7
Factors affecting the onset of using drugs .....	8
Factors affecting the frequency of drug use, addiction and polysubstance use.....	9
Aim of the study .....	9
Research questions .....	9
Hypothesis .....	10
Methods .....	12
Study design .....	12
Study population/ Sample.....	12
Questionnaire development .....	12
Data Collection .....	13
Statistical analysis.....	14
Results .....	15
Factors associated with the onset of using drugs .....	17
Factors associated with the frequency of drug use .....	18
Factors associated with combining alcohol and drugs.....	19
Factors associated with polysubstance use .....	21
Overview of significant variables .....	23
Prediction models.....	24
Discussion .....	25
Comparison to literature .....	25
Implications for practice.....	26
Strengths and limitations .....	26
Conclusions.....	27
References.....	28
Reflection .....	32
Appendices .....	33
Survey .....	33
Tables and figures.....	47

# Summary

## Introduction

Drug use causes a lot of health incidences. Males use more drugs than females. The use of cocaine, XTC and amphetamines is more prevalent in highly educated people than in people with a moderate or low education. A person with a drug using sibling or partner has a greater chance of using drugs themselves. Studies also found that youngsters who live in a city use more drugs than those who live in more rural areas. A religious upbringing, a disapproving attitude of parents and living at home with both parents are protective factors in drug use. Genetic predisposition and personality traits also play a part in starting to use drugs.

## Research questions

Using the model from the theoretical framework, research questions were drawn up: Where do the students receive their drugs? What factors are associated with the onset of drug use? What factors are associated with the frequency of drug use? What factors are associated with simultaneous use of alcohol and drugs? Do drug users drink more or less alcohol than non-drug users? What factors are associated with polysubstance use? What factors predict the different outcome variables? The factors were compiled using the theoretical framework and the literature study. The factors consisted out of community/societal influences, interpersonal influences, individual influences and other influences.

## Methods

This is an observational cross-sectional survey research among Dutch students of all universities. Validated research tools were used to develop the survey: Dast-10, GHQ-12, BIS/BAS scale, EPQ, RPI and AUDIT-C. 4 different outcome variables were used: the onset of drug use, the frequency of drug use, simultaneous use of alcohol and drugs and polysubstance use. A categorical variable is made for the frequency of drug use as a control variable. Logistic regression analysis are used to examine the dichotomous outcome variables: the onset of drug use, simultaneous use of alcohol and drugs and polysubstance use. Linear regression analysis were used to examine the continue variables frequency and its control variable. Prediction models were made to examine what factors predict the different outcome variables.

## Results

56.3% of the students used drugs at least once. Cannabis was the most used drug followed by XTC, 4fmp and cocaine. Factors that were found to be significant with all outcome variables were sex, the frequency of visits to bars, AUDIT, the frequency of alcohol use, the average number of alcoholic drinks per night, the frequency of having 6 or more alcohol drinks, the ever prevalence of smoking, the ever prevalence of nitrous oxide, drug availability, the amount of drug using friends, importance of religion and extraversion.

## Conclusion

The factors that influence all 4 outcome variables are the most relevant factors. Policy strategies and interventions that alter these factors, might be effective in reducing drug use in students and preventing health incidences. Especially preventing polysubstance use and combining alcohol with drugs should be the focus.

# Introduction

Drug use and abuse is a worldwide problem, it increases the prevalence of health disorders, road-traffic accidents, suicides and violence (Degenhardt & Hall, 2012). Drug use raises the number of deaths and costs society a lot of money. Illicit drug use seems to be highest in high-income countries and countries located near major drug producing areas. The overall use of hard drugs among young people in the Netherlands is slightly below the EU average (Monshouwer et al., 2011). In the Netherlands 5% of young people uses hard drugs compared to the European average of 6%. However, XTC use in the Netherlands is high compared to other EU-27 countries. The Netherlands is leading the charts along with the United Kingdom and the Czech Republic for both the percentage of people who used XTC at least once and people who used it in the last year. The Trimbos- institute found that as many as 9% of Dutch students used XTC at least once (Dorsselaer; Goossens, 2015; Verduren et al., 2016; Trimbos, 2016 ). However, data on how much XTC students use, and how many of them used it in the last month is not clear, since a lot of results are contradicting (Dorsselaer & Goossens, 2015). Nonetheless, XTC is by far the most used hard drug in the Netherlands (Trimbos, 2016 ; Laar van & Ooyen-Houben van, 2016).

## Drug classification

The Dutch opium law classifies illicit drugs as hard drugs or soft drugs (Rijksoverheid, n.d.). The classification of drugs and the drug regulation differs per countries (Nutt, King & Nichols, 2013). In general, the Dutch government classifies drugs as hard drugs when they bring an unacceptable risk on health incidences and have a considerable risk on addiction (Rijksoverheid, n.d.). For example, cocaine, XTC and γ-Hydroxybutyric acid (GHB) are classified as hard drugs, but cannabis, psilocybin mushrooms, hypnotics and sedatives (like benzodiazepines and opioids) are soft drugs. There are illicit drugs that are not classified in the opium law, called designer drugs or research chemicals (Fu, & Stojanovska, 2015). These drugs are synthetic analogs of controlled substances that are manufactured and distributed to circumvent drug laws and evade interdiction. The former designer drug 4-fluoroamphetamine (4fmp) is included in the opium law starting April 2017 (NRC, 2016). 4fmp is the most popular new psychoactive drug in the Netherlands (Trimbos, 2016). This popularity is found to be due to the substance effects, which are between the effects of MDMA and amphetamines, and not the legal status of the drug (Linsen et al., 2015). 4fmp is often thought of as the 'light' version of XTC. However, this is in contrast with the increase in health incidences after the use of 4fmp, including the number of very serious cases (Trimbos, 2016).

## Reported health incidences

One explanation for the large number of health incidences is that 4fmp is often used in combination with other drugs. The use of a combination of multiple drugs at the same time is called polysubstance use. Polysubstance use is responsible for 73% of all incidences with 4fmp. 60% of 4fmp incidences were in combination with XTC, and the incidences were mainly with patients under 25 years (Trimbos, 2015). XTC is the most reported drug for incidences at first aid posts on dance events (Laar van & Ooyen-Houben van, 2016). After an increase in XTC intoxications reported at first aid posts between 2009 and 2013, the number of reports decreased in 2014 and 2015 (Goor, 2015). The intoxication levels that were reported for XTC stayed high. The dose (milligram) of XTC per pill has doubled over the last ten years (Goor, 2015). While in 2009 the average amount of MDMA found in XTC was 69mg, this rose to 149 mg in 2015. In 2015 the dangerous substance PMMA was found in 0,8% of the pills sold as XTC and this was lower than in previous years (Laar van & Ooyen-Houben van, 2016). This development is responsible for a rise in moderate to severe intoxications reported at first aid posts. XTC is responsible for the smallest share of patients in rehabilitation facilities, despite the facts that it is most frequently used.

After XTC, cocaine is the second most used hard drug, followed by amphetamines (Laar van & Ooyen-Houben van, 2016). However, according to the Trimbos-Institute, 3% of secondary vocational education (MBO) and applied sciences (HBO) students (aged 16 to 18) used cocaine at least once, while 4% of them used amphetamines at least once (Verdurmen et al., 2016; Trimbos, 2016). 1 in 5 drug related deaths is caused by cocaine (Trimbos, 2016). Incidences with cocaine in large scaled dance events are rarely reported. However, police doctors report incidences relatively often compared to other drugs. Health incidences with just amphetamines are rarely reported but most incidences are caused by polysubstance use. Opiate users end up in rehabilitation facilities most frequently, followed by amphetamines and GHB, and ambulances were called out most for incidences caused by the use of GHB, cannabis and polysubstance use (Pol van & Laar van, 2014). Furthermore, a study from the Trimbos-institue about nitrous oxide showed that 1 in 7 HBO students and MBO students, said that they used nitrous oxide at least once. 1 in 20 students said that they used it in the last month (Verdurmen et al., 2016). However, the use of nitrous oxide leads to very little health incidences, and the incidences that have been reported were almost always polysubstance use (Trimbos, 2015). A study amongst Canadian university students showed that the amount of alcohol the students drink while using cocaine was significantly higher than the amount they drank while only consuming alcohol (Barrett, Darredeau, & Pihl., 2006). They found non-significant trends for increased alcohol consumption in combination with amphetamines.

### Drug harms

A study in the UK has assessed the harms of different drugs (Nutt et all., 2010). They assessed the harm that the drugs had on users and the harms it had on others. It concludes that alcohol is the most harmful drug if both of the harms are combined, and it is the most damaging drug to others (see figure 1). This study took physical, psychological and social damage into account. For example, they looked into the dependence, drug mortality and damage, economic costs and impairment of mental functioning.

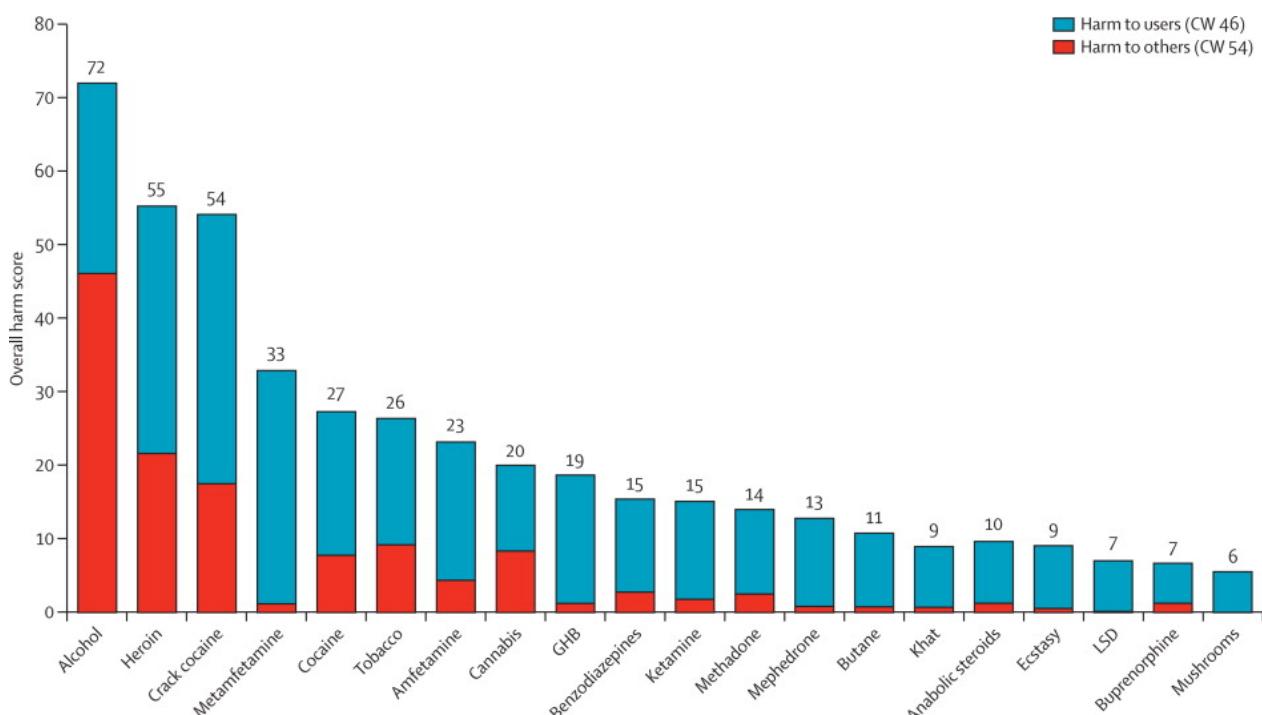


Figure 1 (Nutt et all., 2010)

A drug can be damaging to a user in three ways. The drug itself can be damaging, the route of administration and the conditions where the drugs are used can be harmful (Jellinek, 2016). 92% of all acute health incidences are caused by the intoxication from the drug itself, although this also includes secondary incidences (for example water intoxication from XTC use). The other 8% of acute cases were caused by injury that was acquired during the use of drugs (Trimbos, 2015). The route of administration can be responsible for infection with viruses like hepatitis b or c, HIV or a blood infection for intravenous drug users. Moreover, smoking crack cocaine can lead to abscesses and other lung conditions (Volksgezondheid en zorg, n.d.). One of the most important health effects of hard drugs are the occurrence of addiction and mental health disorders. Heroin, crack cocaine, and methamphetamine have been found to be the most damaging drugs to users, after assessment of all three factors (Nutt et al, 2010). XTC has been an object of research for 20 years, but it is still unknown how harmful it exactly is however, the presumed addictiveness of XTC is very small (Volksgezondheid en zorg, n.d.). Mental disorders are accountable for 81% of the expenses for drug dependency in the Dutch health care system. The most recent numbers are from 2011, and the total costs of drug and alcohol dependency for the Dutch healthcare industry was almost 1,2 billion euro's. This was 1,3% of the total expenses of the Dutch health care, while the costs of mental disorders caused by drug use are accountable for 6,1% of the total costs of mental healthcare (Volksgezondheid en zorg, n.d.). A Belgium study found that almost all of the students who used XTC, amphetamines or cocaine in the last year, have risk factors for problematic use (van Hall, 2007). The fact that half of those students use multiple drugs at the same time might be a key factor, but despite their problematic drug use, these students do not assume that they are dependent of drugs. This could be due to the fact that the students underestimate quitting illicit drugs. Drug users usually get their drugs from a dealer, a friend or they order it on the internet (Jellinek, 2016).

### Theoretical framework

The diagram in figure 2 shows the role of both the risk factors and protective factors of the likelihood of substance use and abuse. These factors do not cause substance use and abuse, but influence their likelihood. The different factors are split into community/societal, interpersonal and individual influences. Examples of community and societal influences are the costs of drugs, the federal laws and the local law enforcement. Peers family and the personal situation of the students belong to the interpersonal influences. Individual influences are genetics, personal beliefs and personality traits (Robertson, David, and Rao, 2013). Since the theoretic model is also applicable to alcohol use, only the relevant community & societal factors will be taken into account. This means that the minimum purchase age, school policy and marketing strategies will be left out since these are the same for everyone (there is no minimum purchase age since illicit drugs are illegal, school policies are all against drugs and there are no marketing strategies).

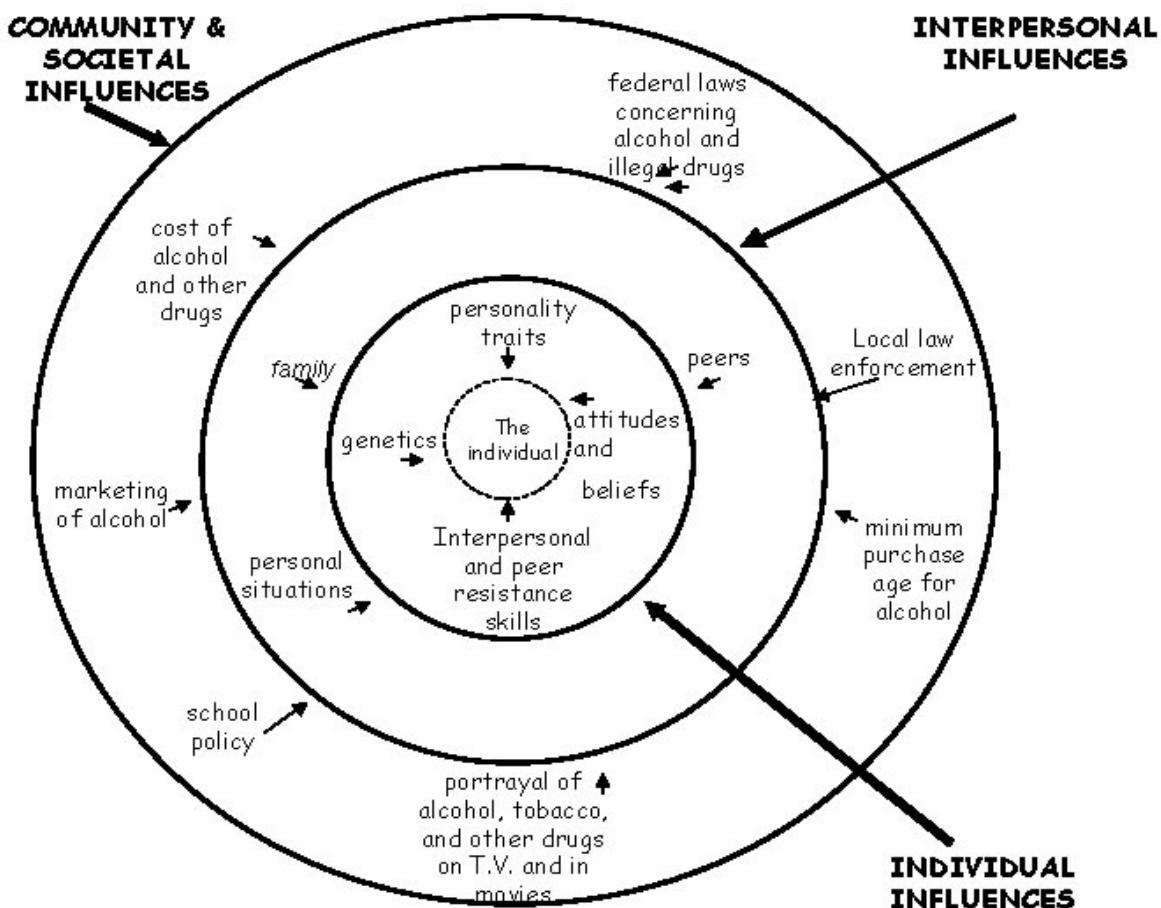


Figure 2 (Robertson, David and Rao, 2013)

### Factors affecting the onset of using drugs

The most common reasons for drug use are: relaxation, to become intoxicated, to keep awake at night and socialize, to enhance an activity and to alleviate a depressed mood (Boys, Masden and Strang, 2001). Reasons for substance use were found to differ by age and gender. An older study found a few different reasons why adolescents use drugs. These reasons were: Belonging, Coping, Pleasure, Creativity, and Aggression. They found age- sex- and user differences as possible reasons why people use drugs (Novacek, 1991). Factors that make people start using drugs can be divided in environmental influences and personal influences. Examples of environmental influences are the availability of drugs and the drug use of friends. A religious upbringing, a disapproving attitude of the parents and living at home with both parents are protective factors in drug use. Personal factors like genetic predisposition and personality traits also play a part in starting to use drugs. An example of this is that the use of cannabis is substantially higher amongst people who go out very often than people who stay in more (Nationaal kompas, n.d. ; Loketgezondleven, 2016). Another study found an association between moving out and studying on a university and an elevation of alcohol and cannabis use in youth (White et al., 2008). A study in Sweden (Kendler et al., 2013) has shown that a healthy person with a drug using sibling or partner has a greater chance of using drugs themselves. This effect is strengthened if the two ages are close to each other. The use of cocaine, XTC and amphetamines is more prevalent in highly educated people than in people with a moderate or low education (Pol van & Laar van, 2014). They also found that youngsters who live in a city use more drugs than those who live in more rural areas (Pol van & Laar van, 2014). However, a contradiction is that GHB is used more outside of the Dutch urban area 'the Randstad' (Trimbos, 2015). This effect could be explained by the fact that people who live in cities, are more highly educated than people in rural areas (Nabben et al., 2007).

## Factors affecting the frequency of drug use, addiction and polysubstance use

Rat models have shown that social deficits like isolation and neglect in adolescent's leads to more drug use and that socially deprived adolescents have a greater chance of addiction. This effect cannot be reversed by later resocialization and is only seen in the adolescents' critical period (Whitaker et al, 2013). People in their twenties also use more drugs than people in other ages categories (Jellinek, 2016). It is estimated that 40 to 60 percent of a person's vulnerability to drug addiction is due to its genetics components. This estimation includes the environmental factors of the gene's expression and function (NIH, 2014). If a person starts to do drugs at a young age, they have a higher risk of addiction and other problems. This may be attributed to the harmful effects drugs have on the developing brain, but it may also be the result of early social and biological vulnerability factors like an unstable family relationship, sexual abuse or mental illness (Lynskey, et al., 2003). Polysubstance use is found to be strongly influenced by peer's drug use in adolescents. Parental disapproval of drug use was associated with reduced polysubstance use, and decreased the influence of peers (Chan, et al., 2017).

## Aim of the study

The aim of this study is to broaden the current knowledge of drug use by students and to understand the external factors that play a role in drug use. This knowledge can be used for the prevention of drug use and to decrease drug related incidences by making the use of drugs safer. To be specific, it can be used for policy and drug related interventions. A lot of research has been done on different target populations, but information for students specific is often missing. Most data was collected for MBO and HBO students, but not for WO students.

This information can be used for the development of specific prevention and policy methods for students. The found evidence that students have an increased alcohol consumption while using drugs (Barrett, Darredeau, & Pihl., 2006), raises the medical relevance of this study. These students can be targeted for both their alcohol and drug use. Selective- and indicated prevention can be done more effectively because of a better few of the characteristics of users. Selective prevention is the prevention of the occurring of drug use in potential users, and indicated prevention is prevention of health incidences for current users, and users with health problems (Goor, 2015). Research has been done on parts of this model, but there has been no research before that took the whole model in account. Furthermore, there has never been a research that looked into the factors associated with polysubstance use and combining alcohol with drugs. However, research about this is of importance because of the large number of reported health incidences with polysubstance use and drinking while using drugs.

## Research questions

The primary questions for this research are: what are the risk- and protective community & societal influences, the interpersonal influences and the individual factors on illicit drug use of Dutch (secondary vocational education: MBO, applied science: HBO and science educations: WO) students? An overview of the factors is listed in table 1. This leads to the following sub questions:

What drugs do students use?

Where do the students receive their drugs?

What factors are associated with the onset of drug use?

What factors are associated with the frequency of drug use?

What factors are associated with simultaneous use of alcohol and drugs?

Do drug users drink more or less alcohol than non-drug users?

What factors are associated with polysubstance use?

What factors predict the different outcome variables?

### Hypothesis

The expectation is that the most used drug is cannabis followed by XTC, cocaine and amphetamines. The hypothesis is that most students get their drugs from their friends. It is expected that MBO use less of these drugs than higher educated students (HBO+WO). The hypothesis is that the more alcohol students drink, the more drugs they use, and that the alcohol use of students is increased by the occurrence of drug use. Table 1 shows an overview of the different factors and the expected direction of the correlations. It is also expected that the different outcome variables have a lot of associated factors in common. The presumption is made that the AUDIT and its questions have an effect on the simultaneous use of alcohol and drugs, and that also the frequency of visits of bars and clubs are associated with this outcome variable. It is also expected that

Influence	Factor	Measurement	Expected direction
Community/societal influences	Availability	Where students get their drugs	
		Easiness of getting drugs	↑
	Cost of drugs	Using drugs because it's cheaper than alcohol	↑
Interpersonal influences	Media Influence	How often they see drugs on TV and social media	↑
		Supposed media portrayal of drugs	↑
		Number of drug using friends	↑
		Drug using siblings	↑
		Drug using parents	↑
	Peers	Other drug using family	↑
		Alcohol use family	↑
		Relationship parents	
		Living in a city	↑
		Living in Amsterdam	↑
Individual influences	Personal situation	Living situation (week and weekend)	
		Frequency of visits to dance events/ bars/ clubs/ receptions of students associations	↑
		Current stress level/ Stress 12 months ago	↑
	Attitudes and beliefs	Religion (Yes/no, type and importance)	↓
		Assessment of lifestyle	↓
		Risk assessment	↓
	Risk assessment	Occurrence of addiction	↓
		Occurrence of drug related accidents	↓
		Effects of drugs on health	↓
	Genetics	History of addiction	↑
		Bis/Bas scale	↑
Other influences	Personality traits	Extraversion	↑
		Mental health	↑
		Fears and depression (GHQ)	↑
		ADHD	↑
		Substance use	Combining alcohol with drugs
	Frequency of drinking (AUDIT)	Frequency of drinking (AUDIT)	↑
		Consumption of more than 6 alcoholic beverages (AUDIT)	↑
		Average number of alcohol beverages (AUDIT)	↑
		Drug abuse (DAST)	↑
		Smoking	↑
Education	(Prescribed) use of stimulus medication	(Prescribed) use of stimulus medication	↑
		Education level	↑
	Mode of study		
Sex	Being a male		↑

**Table 1** This table shows an overview of the factors that will be included in the analysis

# Methods

## Study design

This is an observational cross-sectional survey research among Dutch students of all universities. This research is a collaboration with the Belgian study: heads in the clouds (van Hall, et al., 2007). A part of their survey is used to make future comparison possible.

## Study population/ Sample

People between 18 and 58 years of age who are MBO, HBO or WO students of all majors will be included in this research. To be included, participants have to study in the Netherlands.

## Questionnaire development

The questions are based on the conducted literature research, the model discussed in the introduction (see figure 2) and on the previously done Belgian study (van Hall, 2007). The questionnaire contained 84 questions and takes around 15 minutes to complete. A few research tools are used. An overview is displayed in table 2.

Concept	Scale	Example item	Number of items	Alpha
Drug (ab)use	Dast-10	'Are you always able to stop using drugs when you want to?'	10	.76
Mental health	GHQ-12 subscale: fears and depression	'Have you recently lost much sleep over worry?'	4	.78
Personality	Bis/bas scale	'I often act on the spur of the moment.'	19	.79, .61, .68, .59*
Personality: Extraversion	EPQ subscale: Extraversion	'Can you easily get some life into a dull party?'	12	.85
Peer pressure resistance	RPI	'Some people will not break the law just because their friends say that they would. BUT Other people would break the law if their friends said that they would break it.'	10	.74 (English version)
Alcohol (ab)use	AUDIT-C	'How often do you have a drink containing alcohol?'	3	.80

**Table 2** This table shows an overview the used research tools \* BIS, BAS-Reward Responsiveness, BAS-Drive and BAS-Fun

Dast-10 is the shortened version of the drug abuse screening test. These questions assess the use of more drugs than prescribed, or the use of drugs on non-medical grounds (Skinner, 1982; Yudko, Lozhkina, and Fouts, 2007; van der Heijde, Vonk & Meijman, 2015). The AUDIT-C is a reliable screening tool containing 3 items that identifies patients that are hazardous drinkers or have an alcohol disorder (Bush, et al., 1998). The BIS/BAS Scale is a shortened version of the Eysenck Personality Questionnaire (EPQ) and the Dickman Impulsivity Inventory (Carver & White, 1994). The punishment sensitivity scale (BIS) is used to measure the anticipation of punishment. There are three BAS-related scales: the drive scale, the fun seeking scale and the reward responsiveness scale. The drive scale is reflecting to the constant pursuit of desired goals. The fun seeking scale focusses on both a desire for new rewards and the willingness to approach a potentially rewarding event on the spur of the moment. And thirdly, the reward responsiveness scale measures positive responses to

the occurrence or anticipation of reward (Jorm, 1998). A study among Dutch college students found correlations between the Bis/bas scale and their drug use. The BAS was positively correlated with drug use, and BIS personality characteristics were negatively correlated (Franken & Muris, 2006; Franken, Muris & Rassin, 2005). Additionally, one subscale of the Eysenck Personality Questionnaire (EPQ) is used to determine extraversion of the participants (Sanderman, Arrindell & Ranchor, 1995). The general health questionnaire (GHQ-12) is used to assess the mental health of the participants and to identify minor psychiatric disorders. It focusses on two area's: the inability to carry out normal or healthy functions and the appearance of new and distressing phenomena (Makowska, et al., 2002). The fears and depression subscale of the GHQ-12 is used. The two lowest scores are recoded to a 0, and the two highest scores are recoded to a 1. The scores are sum up, and the higher this total is, the stronger the feelings of fear and depression (van Hall, 2007). The resistance to peer pressure scale is a suited instrument for late children to young adults. Resistance to peer pressure has been found to differ within different age groups, however, there were no age differences found in peer pressure resistance within the group of 18 to 30 year olds (Steinberg & Monahan, 2007). The scale has been translated to Dutch and has been checked by a professional English to Dutch translator (Sumter, Bokhorst, Steinberg, & Westenberg, 2009).

Media influence on drug use was assessed using a preexisting question about what students think that the media is making substance use look like (Rosenbaum & Hanson, 1998). Students who responded that the media made substance use look like both a good and a bad thing to do, or neither a good nor a bad thing to do, were labeled as a neutral category between those who thought that the media made it look like a good think, and those who thought they made it seem like a bad thing to do. Additionally, students are asked if they often see drug use on TV, movies and social media. The genetic makeup from the participants cannot be determined, but the family history of substance abuse is asked to see if this heritance has an effect on drug use. To assess if federal laws have an influence on drug use, 4fmp users will be asked to indicate whether the change of legal status is of influence on their use of the drug. The students will be asked about their alcohol consumption to see if students who use more alcohol also use drugs more frequently as well as how much alcohol students use in combination with different drugs. The frequency of drug use was asked for every drug that the student used. The answer categories were: less than every year, annually, every six months, every other month, monthly, weekly and daily. These answers were coded with numbers ascending from 1 to 7. For example, less than every year was coded with 1, and daily with 7. The numbers of every drug were sum up to make one variable for the frequency of drug use. Students who never used drugs were coded with a 0. Afterwards, a categorical variable was made for the frequency of drug use with 4 categories: no drug use, occasional use, regular use and intensive drug use.

## Data Collection

Data is collected using an online survey and is conducted using Surveymonkey. An email is send to a random selection of 2300 patients of the general practitioners 'Oude Turfmarkt | Studentenartsen'. This general practice is specified on students and has 11 general practitioners. 712 participants of the student's health check (Van der Heijde, Vonk & Meijman, 2015). The students health check (Studentengezondheidstest.nl) is an online questionnaire that gives personal feedback on your health. Students who gave their permission to be contacted for further research were emailed for this study. Reminders are send after a week, to positively influence the response rate. Facebook is used to find respondents as well. This is done in the Facebook 5 groups of Life and Health sciences, the Facebook group: 'respondenten gezocht' and on the personal Facebook page of the researcher plus some Facebook friends who shared the page. The participants will be anonymous to guarantee their privacy, however they do have the choice to leave their email address at the end of the survey for a chance of winning a voucher for bol.com.

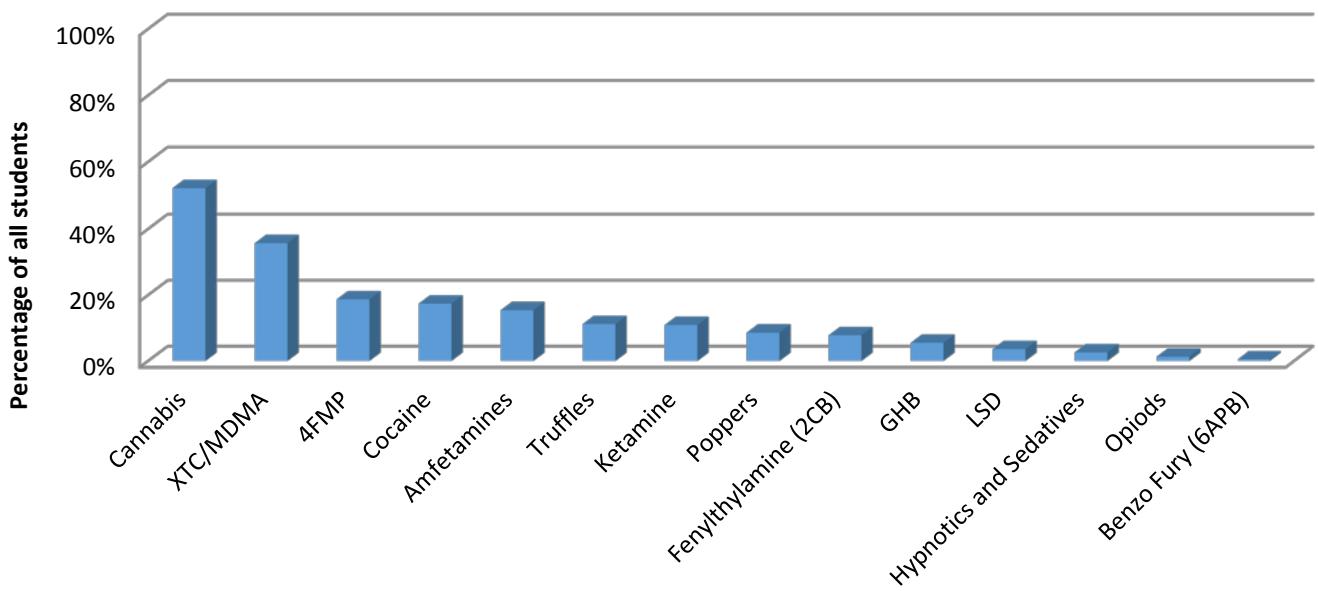
## Statistical analysis

Data is analyzed using SPSS. The main question: what factors influence student's drug use? can be answered using exploratory research methods. These methods will be used for 4 different outcome variables: the onset of drug use, frequency of drug use, combining alcohol with drugs and polysubstance use. A categorical variable is made to serve as a control variable for the scale of the frequency for drug use. Linear regression analyses were used with both variables because both of the variables are continue. Logistic regression analysis are used for the onset of drug use, combining alcohol with drugs and polysubstance use. The assumptions for logistic regression analysis were taken into consideration which means that the outcome variable had to be dichotomous and that continue and categorical independent variables were analyzed to check if there was a linear relationship with the dependent variable. If a non-linear relationship was found, the variable was divided into quartiles or a quadratic term was computed. Questions about the type of drugs students use and where they receive their drugs were answered using descriptive research. The students were asked to compare their recent drug use with their drug use 12 months ago. This was related to a change in stress levels and to a change in the frequency of visits to dance events and clubs. Before comparison of the different groups of students, the baseline characteristics are analyzed. Prediction models are made for every outcome variable. The backward selection procedure is the most efficient way to make a prediction model. However, this is only the case if the number of variables is not too big, which is why a preselection of variables will be made. At first for every possible predictor the relationship with the outcome variable will be determined, after which the backward selection procedure will be used to find the prediction model (Twisk, 2014). The used cut off point for this preselection is 0.05 and not 0.10 or 0.20, because of the already large number of significant variables. Confounding and effect modification are also examined. Based on the found literature about differences in drug use for sex, living in a city and education level (Pol van & Laar van, 2014; Novacek, 1991), these factors might be effect modifiers. Confounding is found if the regression coefficient differs in the association with and without the addition of the possible confounding. Effect modification is examined by adding an interaction term and see if it is significant or not (Twisk, 2014).

# Results

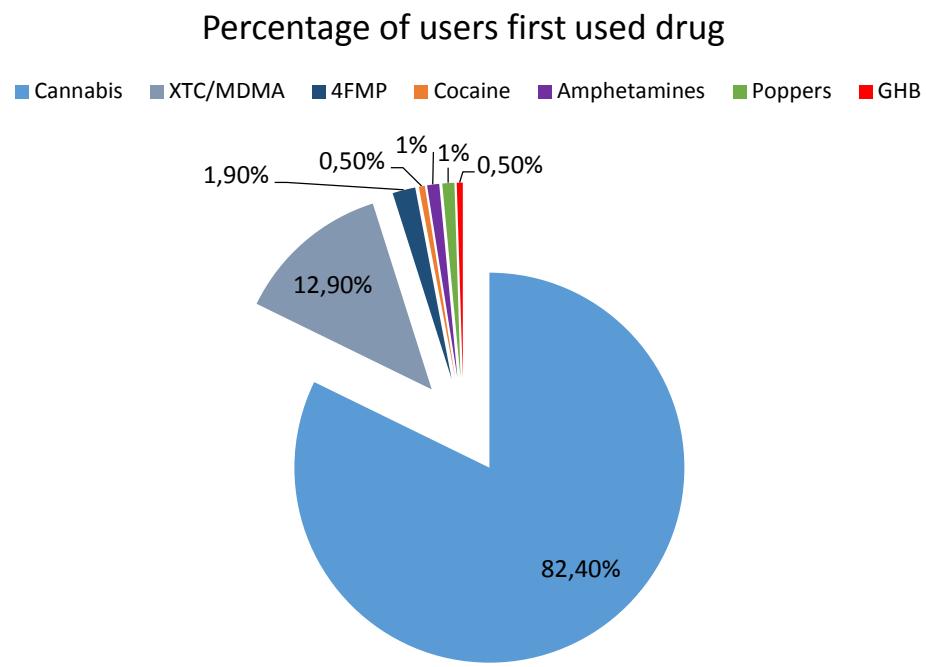
The survey had 421 respondents with 360 complete surveys. 227 respondents were collected through the student's health check (response rate= 31,9%), 130 from Facebook (response rate unknown) and 64 from the patient database (response rate 2,8%). After the non-students were filtered out, the database consisted of 405 respondents. Additionally, 4 students were filtered out because they studied in another county, which left 401 students in the database with still 360 complete surveys (89,8%). All 401 students were included for the analysis even if their survey was not completed. The mean age is 22.55, ranging from 18 to 58. The database consists of 129 HBO students, 175 WO bachelor students, 90 WO master students, 5 MBO students and 2 PHD students. More woman (77.1%) filled out the survey than man (22.9%). 217 students live in Amsterdam and 120 students live in different cities. 16,2% lives around a city and 3,7% does not live near a city.

**Percentage of users per drug**



**Graph 1** This graph shows the number of students that used the different kind of drugs

216 students (56.3%) used drugs at least once. The average age that the students started to use drugs is 17.6 years old, and ranged from 12 to 26. 172 students (44,7%) used nitrous oxide at least once in their lives. Graph 1 shows the drugs that the students have indicated to use. 63% of drug users have used XTC or MDMA. 4FMP is the third most frequently used drug. 30% of students who use 4FMP say that they will use less 4FMP now that it is illegal; however, 70% of students say that the change in legal status of 4FMP does not have any effect on their use of it. Psilocybin mushrooms, crack cocaine, methamphetamines, mephedrone, LSA, MDA, mescaline and 3FAA were all reported one time.



**Graph 2** This graph shows what percentage of students used the different drugs first

As seen in graph 2, 82,4% of the drug users reported that cannabis was the first drug they used and 12,9% used XTC first. Graph 3 shows that most students (77,1%) get their drugs from their friends. 12,9% get their drugs from a known dealer.



**Graph 3** This graph shows where the students get their drugs

All used scales were checked for internal consistency with a Cronbach's alpha (see table 3).

Scale	Cronbach Alpha
Risk assessment	,727
AUDIT	,752
DAST	,564
Stress	,866
GHQ	,744
EPQ	,857
RPI	,448
BIS	,843
BAS-Drive	,684
Bas-fun seeking	,540
BAS reward responsiveness	,603

**Table 3** This table shows the Cronbach alpha scores in this population

## Factors associated with the onset of using drugs

The students were asked if they have ever used drugs. 216 students (56.3%) said that they have ever used drugs and 168 students (43.8%) said that they have not. Comparison of the baseline characteristics (table 4) shows that more men than women use drugs. More drug using students live in a city, and students living in Amsterdam use more drugs than students living outside of Amsterdam.

Logistic regression shows that drug use is associated with the factors below.

### Baseline Characteristics

Drug use	Total	Yes	No
Age	22,6	22,9	22,1
Sex (% female)	77,1	72,7	85,7
% MBO	1,2	5,0	1,8
% HBO	33,4	32,9	32,7
% WO bachelor	43,6	43,5	41,7
% WO master	22,4	22,2	23,8
% PHD	0,5	9,0	0,0
% Living in a city	80,0	84,3	72,6
% Living in Amsterdam	52,1	61,1	38,1

**Table 4** This table shows an comparison of the baseline characteristics of students who use drugs versus students who do not use drugs

Variable	Significance	Direction	B	Odds Ratio
Sex (female)	,002	↓	,813	2,255
Religion (dichotomous)	,002	↓	,797	2,218
Importance of religion	,024	↓	,413	1,511
Living situation weekend	,000		,586	1,797
Living in a city	,006	↑	-,702	,495
Living in Amsterdam	,000	↑	-,932	,392
Parents together	,006	↓	,669	1,953
Frequency of visits to dance events	,000	↑	-1,160	,314
Frequency of visits to clubs	,000	↑	-,735	,480
Frequency of visits to a bars	,000	↑	-,680	,507
Frequency of alcohol consumption	,000	↑	-1,058	,347
Average number of glasses of alcohol consumed	,000	↑	-,800	,449
Frequency of consumption of more than 6 glasses of alcohol	,000	↑	-,999	,368
AUDIT	,000	↑	-,475	,622
The ever prevalence of smoking	,000	↑	2,345	10,425
Ever prevalence of nitrous oxide	,000	↑	2,548	12,783
Drug availability	,000	↑	2,499	12,169
Media influence	,021	↑	,463	1,589
Sibling drug use	,000	↑	-,415	,243
Parents drug use	,019	↑	-,316	,268
Amount of friends using drugs	,000	↑	-,684	,186
Extraversion	,000	↑	,239	,787
Bas Fun Seeking	,000	↑	,225	,799
Bas Reward Responsiveness	,033	↑	,130	,878

**Table 5** This table shows all of the associated factors with the onset of drug use

Table 5 shows an overview of all the associated factors. Both where the students live in during the week and in the weekend are significantly related to the onset of drug use, however, if taken both in the equation, only the living situation in the weekend is related to whether a student uses drugs. This was the case with all of the outcome variables. The use of stimulus medication and the prescribed use of stimulus medication had a significant association with the onset of drugs use. However, if the variable whether or not ADHD or ADD was diagnosed is included in the logistic regression analysis, the ADHD/ADD diagnose is found to be a confounder in the association.

### Factors associated with the frequency of drug use

Linear regression analyses with both frequency of drug use as a scale and as a categorical variable gave similar results. Odds ratios could not be calculated because the outcome variable is linear. The B is given of the scale variable of frequency and it indicates how much the outcome changes per step of the determinant. An overview of all the significant factors is listed in table 6. Baseline characteristics could not be compared because of the continuous outcome variable.

Variable	Significance (scale)	Significance (categorical)	Direction	B (scale)
Sex (female)	,000	,000	↓	-5,079
Living in a city	,004	,004	↑	2,455
Living in Amsterdam	,000	,000	↑	3,204
Living situation weekend	,001	,001		,1516
Education level	,018		↑	,200
Importance of religion	,007	,001	↓	-1,323
Frequency of visits to dance events	,000	,000	↑	4,333
Frequency of visits to clubs	,000	,000	↑	2,025
Frequency of visits to bars/ café's	,000	,000	↑	1,566
Frequency of alcohol consumption	,000	,000	↑	2,309
Average number of glasses of alcohol consumed	,000	,000	↑	2,583
Frequency of consumption of more than 6 glasses of alcohol	,000	,000	↑	2,949
AUDIT	,000	,000	↑	1,366
The ever prevalence of smoking	,000	,000	↑	-5,249
Ever prevalence of nitrous oxide	,000		↑	-6,284
Age of starting drugs	,013		↑	-,525
Use of more drugs after the start of the study	,000	,000	↑	-4,260
Costs of drugs	,005	,004	↑	1,498
Risk assessment	,044		↓	-,451
Using drugs alone	,000	,001	↑	-23,173
Combining alcohol and drugs	,000	,000	↑	-5,528
DAST	,000	,000	↑	2,849
Drug availability	,000	,000	↑	-4,796
Media influence	,008		↑	-1,658
Sibling drug use	,002	,000	↑	2,439
Parents drug use	,021		↑	3,479
Drug use of other family	,050		↑	1,698
Amount of friends using drugs	,000	,000	↑	4,643
Overall health	,020		↓	,806
Lifestyle	,006		↓	-1,151
Extraversion	,000	,000	↑	,447
Bas Drive	,047		↑	-,323
Bas Fun Seeking	,000	,000	↑	,676

Table 6 This table shows all of the associated factors with the frequency of drug use

Linear regression with more drug use as the dependent variable and more stress as the independent variable shows that more stress associated with an increase in drug use (significance= ,005 B=-,934 and Odds Ratio= ,393). However, an increase in visits to clubs and dance events was not significantly related to an increase in drug use.

## Factors associated with combining alcohol and drugs

Comparison of drug users versus non drug users shows differences in their alcohol use. Drug users drink more often, when they drink they consume more alcoholic beverages and it happens more frequently that they consume more than 6 glasses of alcohol per day. 41,7% of the drug users drinks 2 to 3 times a week, while only 19,0% of not drug users drinks that much. 23,8% of non-users never drinks alcohol, compared to 1,4% of the drug users. 60% of all drug users drink alcohol while using drugs. Comparison of

the baseline characteristics (table 7) shows that more male drug users combine alcohol with drugs than female drug users. More students living in cities combine alcohol and drugs than those who do not live in a city. Furthermore, students living in Amsterdam combine alcohol with drugs than students living in a different city than Amsterdam. WO bachelor students are the only group of students who have a higher percentage that drinks during drug use. All the other education levels have more students who do not mix alcohol with drugs.

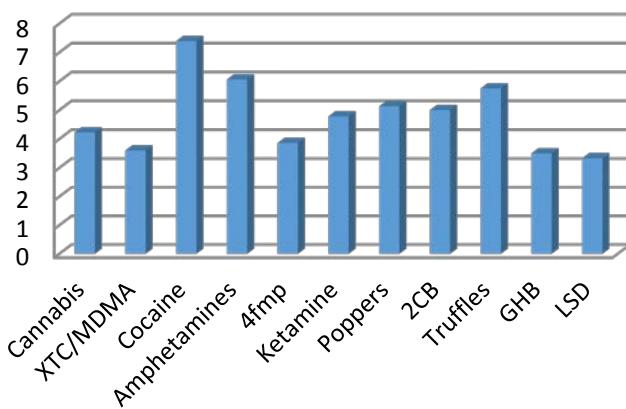
Graph 4 displays the average number of alcoholic beverages that the students have indicated to use per drug. Graph 5 shows the percentage of students that drinks alcohol per drug out of all the students that use that drug. Both graphs are ordered by prevalence of its use. Noteworthy is

### Baseline Characteristics

Mixing alcohol and drugs	Total	Yes	No
Age	22,6	22,9	22,8
Sex (% female)	77,1	67,5	82,1
% MBO	1,2	0,0	1,2
% HBO	33,4	31,0	35,7
% WO bachelor	43,6	46,8	39,3
% WO master	22,4	21,4	22,6
% PHD	0,5	0,8	1,2
% Living in a city	80,0	85,7	81,0
% Living in Amsterdam	52,1	63,5	54,8

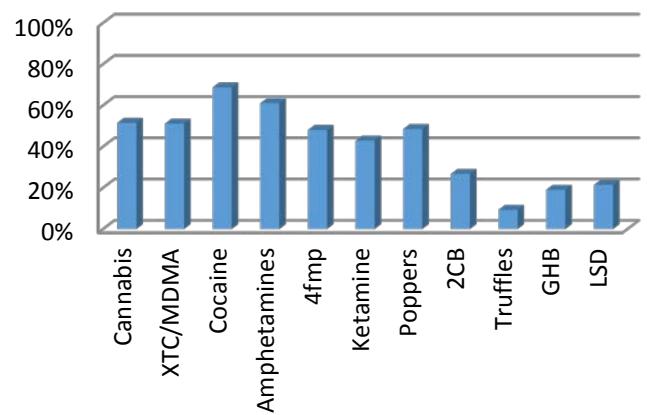
**Table 7** This table shows an comparison of the baseline characteristics of students who mix alcohol and drugs versus students who do not mix alcohol and drugs

### Average number of alcoholic beverages per drug



**Graph 4** This graph shows the average number of alcoholic drinks consumed in combination with the different drugs

### Percentage of all users that drink during drug use



**Graph 5** This graph shows the percentage of all the students that consumed alcohol in combination with the different drugs out of all the students that used that drug

that the average amount of alcoholic beverages consumed by the group that uses cocaine is significantly higher than the amount of glasses consumed while using cocaine. Cocaine users use on 2,8 glasses on a typical day, but they use 7,4 glasses while using cocaine.

Logistic regression analysis with whether or not a student combines alcohol with drugs resulted in a few significant factors (see table 8).

Variable	Significance	Direction	B	Odds Ratio
Sex (female)	,020	↓	,797	2,219
Living situation weekend	,019		,522	1,685
Importance of religion	,010	↓	1,618	5,043
Frequency of visits to bars	,000	↑	-,490	,613
Frequency of alcohol consumption	,000	↑	-,950	,387
Frequency of consumption of more than 6 glasses of alcohol	,000	↑	-,924	,397
Average number of glasses of alcohol consumed	,017		-,368	,692
AUDIT	,000	↑	-,396	,673
The ever prevalence of smoking	,000	↑	1,299	3,667
Ever prevalence of nitrous oxide	,005	↑	,838	2,312
The frequency of drug use (both scale and categorical)	,000	↑	-,160	,852
Age of starting drugs	,017	↑	,144	1,155
Use of more drugs after the start of the study	,000	↑	1,043	2,839
Getting drugs from a regular dealer	,002	↑	-2,398	,091
Drug availability	,004	↑	1,577	4,840
Risk assessment	,031	↓	,134	1,144
Parents drug use	,046	↑	-1,294	,274
Regular alcohol use of family members	,004	↑	-,490	,613
Amount of friends using drugs	,002	↑	-,996	,369
Extraversion	,021	↑	-,114	,893
Bas Fun seeking	,031	↑	-,156	,855
Bas Reward Responsiveness	,046	↑	,179	1,196

Table 8 This table shows all of the associated factors with the simultaneous use of alcohol and drugs

Compared to non drug users, drug users drink alcohol more often, their average number of alcoholic drinks per day is higher and it happens more often that they consume 6 or more alcoholic beverages on one occasion (see appendix).

## Factors associated with polysubstance use

36% of all drug users engage in polysubstance use. Comparison of the two groups (table 9) shows that more males than females use different drugs at the same time. The average age of the polysubstance group is slightly higher than the single drug use group, which might indicate that students start polysubstance use at a later age. Noticeable is that the group of HBO students and WO master students have more students who do polysubstance use than those who do not combine drugs. There are more WO bachelor

students who do not combine drugs together than students who do mix drugs. The database contained no MBO and PHD students who engaged in polysubstance use. The group of students that engaged in polysubstance use had a lot more students living in a city than the group of students who did not. Also the amount of students living in Amsterdam was a lot bigger. Table 10 shows the combinations of drugs that the students reported. The number shows the amount of students who used the combination. XTC is the most frequently combined drug, followed by cannabis. Cannabis and XTC combined are the most reported combination. The most reported hard drugs combination is XTC/MDMA and amphetamines followed by 4FMP and XTC/MDMA. Truffles are rarely combined with different drugs, but 2CB and Ketamine are relatively often mixed with XTC, amphetamines, cocaine and 4FMP. In general, cannabis, XTC, 4FMP, cocaine and amphetamines are frequently combined with different drugs.

### Baseline Characteristics

Polysubstance use	Total	Yes	No
Age	22,6	23,3	22,7
Sex (% female)	77,1	60,8	80,3
% MBO	1,2	0,0	0,7
% HBO	33,4	36,5	30,7
% WO bachelor	43,6	39,2	46,7
% WO master	22,4	24,3	20,4
% PHD	0,5	0,0	1,5
% Living in a city	80,0	94,6	78,1
% Living in Amsterdam	52,1	74,3	52,6

**Table 9** This table shows a comparison of the baseline characteristics of students who engage in polysubstance use versus students who do not engage in polysubstance use

### Used drug combinations

	Cannabis	XTC/MDMA	4fmp	Cocaine	Amphetamines	Truffles	Ketamine	Poppers	2CB
<b>Cannabis</b>	-	34	11	11	15	11	8	5	4
<b>XTC/MDMA</b>	34	-	22	15	28	1	12	5	6
<b>4fmp</b>	11	22	-	4	9	-	4	1	3
<b>Cocaine</b>	11	15	4	-	8	-	7	-	2
<b>Amphetamines</b>	15	28	9	8	-	-	10	2	4
<b>Truffles</b>	11	1	-	-	-	-	-	1	-
<b>Ketamine</b>	8	12	4	7	10	-	-	1	2
<b>Poppers</b>	5	5	1	-	2	-	1	-	2
<b>2CB</b>	4	6	3	2	4	-	2	2	-
<b>GHB</b>	3	4	2	3	6	-	2	-	-
<b>LSD</b>	5	1	-	-	1	1	1	-	-
<b>Benzo Fury</b>	1	2	1	-	-	-	-	-	-
<b>Mephedrone</b>	-	1	-	-	1	1	1	-	-

**Table 10** This table shows the number of times that a combination was reported

28,6% of students that used ketamine combined it with XTC or MDMA and 20,7% of 2CB users combined 2CB with XTC or MDMA. 48,3% of amphetamine users combines it with XTC or MDMA.

Logistic regression showed a few associations with polysubstance use, noted table 11 below.

Variable	Significance	Direction	B	Odds Ratio
Sex (female)	,003	↓	,965	2,626
Living in a city	,004	↑	-1,591	,204
Living in Amsterdam	,002	↑	-,961	,383
Importance of religion	,041	↓	,880	2,410
Frequency of visits to Dance Events	,000	↑	,748	,473
Frequency of visits to Bars	,011	↑	-,287	,750
Frequency of alcohol consumption	,000	↑	-,861	,423
Average consumption of alcoholic beverages per day	,000	↑	--,590	,554
Frequency of consumption of more than 6 glasses of alcohol	,000	↑	-,720	,487
AUDIT (male)	,028	↑		
AUDIT (female)	,000	↑		
The ever prevalence of smoking	,001	↑	1,207	3,343
Ever prevalence of nitrous oxide	,000	↑	1,728	5,628
The age of starting doing drugs	,001	↓	,219	1,245
Frequency of drug use (categorical and scale)	,000	↑	-,376	,687
Use of more drugs after the start of the study	,002	↑	,948	2,582
Drug availability	,021	↑	2,402	11,042
Lifestyle	,013	↓	,472	1,602
Extraversion	,030	↑	-,114	,892
DAST	,000	↑	-,647	,524
Combining alcohol with drugs	,000	↑	2,033	7,639
Amount of friends using drugs	,000	↑	-,1,906	,149
Bas Drive	,016	↓	,178	1,195

Table 11 This table shows all of the associated factors with polysubstance use

Again, the use of stimulus medication and the use of prescribed stimulus medication were found to have a significant association with polysubstance use, but a diagnosis of ADHD/ADD is a confounder in the association.

Sex was found to be an effectmodicator in the association between the AUDIT and polysubstance use. The database was stratified for sex to find 2 separate associations.

## Overview of significant variables

Table 12 shows an overview of all the significant associations between the different outcome variables. A green box means that an association has been found. If the box is red, an association has not been found. A white box indicated that the independent variable cannot be related to the outcome variable.

Factors	Onset of drug use	Frequency of drug use	Alcohol with drugs	Polysubstance use
Sex				
Frequency of visits to bars				
AUDIT				
Frequency of alcohol consumption				
Average consumption of alcoholic beverages per day				
Frequency of consumption of more than 6 glasses of alcohol				
The ever prevalence of smoking				
Drug availability				
Amount of friends using drugs				
Extraversion				
The ever prevalence of nitrous oxide				
Importance of religion				
Living situation weekend				Red
Parents drug use				Red
Bas fun seeking				Red
Living in a city			Red	
Living in Amsterdam			Red	
Frequency of dance events			Red	
Age of starting drugs				
Use of more drugs after the start of study				
Sibling drug use			Red	Red
Media influence			Red	Red
Frequency of visits to clubs			Red	Red
BAS reward responsiveness		Red	Green	Red
Risk assessment		Red	Red	Green
Combining alcohol and drugs		Green		
DAST	Red	Green	Red	Green
Lifestyle	Red	Green	Red	Green
Frequency of drug use				
Occurrence of religion	Green	Red	Red	Red
Parents together	Green	Red	Red	
Education level	Red	Green	Red	
Costs of drugs		Green	Red	
Using drugs alone		Green	Red	
Drug use of other family members	Red	Green	Red	
Overall health	Red	Green	Red	
Getting drugs from a regular dealer		Red		
Regular alcohol use of family members	Red	Red	Green	Red

Table 12 This table shows an overview of how the different significant variables are related to the outcome variables

## Prediction models

A prediction model could not be fitted for the frequency of drug use and polysubstance use, because the number of participants is too low for the number of factors. Prediction models for the onset of drug use (table 13) and the simultaneous use of alcohol and drugs (table 14) did succeed. These factors predict the outcome.

Prediction model for the onset of drug use

Factors	Significance	B	Odds Ratio
Living situation weekend	,002	,405	1,499
Frequency of dance events	,026	-,491	,612
Frequency of alcohol consumption	,004	-,482	,617
The ever prevalence of smoking	,000	1,232	3,427
The ever prevalence of nitrous oxide	,000	1,415	4,118
Drug availability	,000	1,572	4,815
Media influence	,009	,784	2,191

Table 13 This table shows the prediction model for the onset of drug use

Prediction model for the simultaneous use of alcohol and drugs

Factors	Significance	B	Odds Ratio
Frequency of consumption of more than 6 glasses of alcohol	,002	-,620	,538
The ever prevalence of smoking	,001	1,259	3,523
Frequency of drug use	,003	-,102	,903
Use of more drugs after the start of study	,015	,890	2,434
Regular alcohol use of family members	,039	-,034	,966

Table 14 This table shows the prediction model for the simultaneous use of alcohol and drugs

# Discussion

56.3% of students in the study population used drugs at least once. However, drug use is probably underrated since the research population contains more female students and males use more drugs. Cannabis is the most used drug, and is also most used as first drug. XTC/MDMA is the second most used drug. Most students get their drugs from their friends. The factors that are correlated with the outcome variables have a lot of overlap with each other. Sex, the frequency of visits to bars, AUDIT and its three questions, the ever prevalence of smoking, drug availability, the amount of drug using friends, the ever prevalence of nitrous oxide, importance of religion and extraversion are all factors that are correlated with all 4 outcome variables.

## Comparison to literature

37,5% of the research population used hard drugs at least once. This contains XTC/MDMA, cocaine, 2CB, amphetamines and LSD users. For better comparison, 4fmp is omitted from this percentage. According to the Trimbos institute 5% of young people in the Netherlands use hard drugs (Monshouwer et al., 2012). 44,7% used nitrous oxide at least once in their lives. However, the Trimbos institute found that 14,3% of HBO and MBO students used nitrous oxide at least once (Verdurmen et al., 2016). The drug use of the research population is significantly higher than of the general population. 4fmp was the second most used drug in this research population; however, the Trimbos institute found that cocaine is second most used drug but they noted that the use of 4fmp is strongly increasing. This could mean that either this research found a lead that students use more 4fmp than the overall generation, or that this research population has a bias. Since the respondents consisted of more highly educated students than the general population, the use of XTC, cocaine and amphetamines are most likely overrated. This might be another explanation for the large number of 4fmp users. Also the fact that more people living in cities were included in the research population might be a misrepresentation for the actual numbers for used drugs. The high number of average alcoholic beverages consumed during cocaine use and the high percentage of users drinking during the use of cocaine might be explained by the fact that when alcohol and cocaine are combined, they form a new drug called cocaethylene. Cocaethylene decreases feelings of drunkenness, increases the experienced euphoria and results in a longer lasting effect (Farré, et al., 1993). Cocaethylene is more lethal and more cardio toxic than cocaine (Hearn, et al., 1991; Wilson, et al., 2001). The low percentage of users that combines alcohol with truffles could be explained by the bad side effects of this combination (van Amsterdam, Opperhuizen & van den Brink, 2011). It is speculated that mixing truffles or psilocybin mushrooms with alcohol increases the chance on a bad trip and fatal intoxications. Polysubstance use is found to be strongly influenced by peer's drug use in adolescents (Chan, et al., 2017). This is in line with the finding that polysubstance use was found to be associated with the number of drug using friend. Sibling drug use was found to be significant with both the onset of drug use and its frequency. The relationship between sibling drug use and the onset of drug use was previously found (Kendler et al., 2013). It has been found before that people who live in a city use more drugs than those who live in more rural areas (Pol van & Laar van, 2014). However, in this research population the difference was very minimal. 85,7% of drug users lived in a city while 81,0% did not live in a city. A possible explanation could be that because the study population is students and they all live near universities. This could be explained by the fact that more students live around a city, or spend a lot of time in a city but do not live there. This is supported by the frequencies of areas. Only 3,7% of students does not live around a city, while 16,2% lives around a city. A correlation between extraversion and drug use has never been found, however, it has been proven that extraversion predicts heavy drinking in college students (Martsh & Miller, 1997). One

study previously studies the relationship between the EPQ scale and illicit drug use, but they only found an association for the psychotism subscale (Newbury-Birch, White & Kamali, 2000). The association between parents drug use and the onset of drug use was previously found to be minimal compared to the drug use of peers and siblings (Needle, et al., 1986). In this research the effects of parental drug use, peers and siblings are more similar. Reportedly, the effects of parental drug use on the frequency of drug use and combining alcohol with drugs have not been studied before.

### Implications for practice

More research has to be done to find causal effect between the different factors and the outcome variables. The AUDIT and all three of its questions are significant with all of the outcome variables. This means that alcohol use plays a key role in the onset of drug use, its frequency, combining drugs with alcohol and polysubstance use. Therefore, alcohol interventions can be beneficial for lowering drug use as well. Living in Amsterdam is associated with the onset of drug use, its frequency and with polysubstance use. This knowledge can be used for specializing interventions for students in Amsterdam. The costs of drugs are associated with the frequency of drug use. The students were asked if they ever used drugs instead of alcohol because drugs were cheaper. Policy strategies can be used to make cannabis more expensive to lower the frequency of drug use in students. Cannabis is the most frequent first used drug. A raise in costs might restrict some students from using drugs. The assessment of the students overall health and lifestyle are also associated with the frequency of drug use. Interventions to increase overall health and a healthy lifestyle could be specialized for drug users to lower the frequency of their drug use. Research can be done to see if lifestyle interventions can be used to prevent polysubstance use as well, since these are also correlated. The media influence can be reduced by restricting the positive items about drug use. This could be of influence of the onset of drug use and its frequency. Risk assessment is correlated with both the frequency of drug use and whether or not a person combines alcohol with drugs. Indicated prevention can be used to lower the frequency of drug use. Intervention strategies can be tuned to raise risk assessment of students to lower their frequency of drug use. The age of starting drugs is associated with the frequency of drug use, mixing alcohol with drugs and polysubstance use. This means that it is very important to make sure that students start doing drugs at a later age. Interventions and policy can be used to target this problem, and to delay the age that drug use occurs. The age that cannabis can be purchased can be raised, and interventions can start before the age that drug use occurs. The association between regular alcohol use of the student's family members and drinking while using drugs needs to be looked into more so awareness can be spread to the family members of problematic users.

### Strengths and limitations

Reportedly, research about the factors that influence polysubstance and combining alcohol and drugs has not been done on a large scale. Data is often missing and interventions and policy are not specialized on preventing these. Reportedly, frequency of visits to bars in relation to drug use has not been found before. However, since this is correlated with all of the outcome variables, it might be important to look into specializing interventions. A lot of factors were researched the same time and in relation to different outcome variables. Reportedly, this has not been done before. Another strength is that validated research tools were used to measure certain concepts. This contributes to the overall validity of the study. Another strength is that the number of respondents is relatively high.

A limitation is that the research tool automatically coded a yes as 1 and no as 2 in the statistic tool SPSS. Because of the reversed coding some odds-ratios have to be interpreted the other way around. For example, with the onset of drug use this means that the odds ratio now gives the odds that a

student doesn't use drugs instead of the odds that a student uses drugs. The factors where this reversed interpretation is applicable can be seen in the direction of the correlation.

Due to limitations with the survey tool, frequency of other drugs was not reported. The RPI scale was found confusing and too hard, which might have led to the low Cronbach alpha scale. DAST was asked in a 5 point scale but later converted to the original 2 point scale. Question 9 was forgotten and later submitted to the scale which might have led to the low Cronbach alpha. The lowest answer category for frequency of smoking was 10 or less. This was a question conducted from the heads in the clouds study (van Hall, et al., 2007) but a lot of people only smoked 1 or 2 cigarettes a day. It would have been better if more answer categories were included. There might have been some confusion about the age of starting drugs to whether or not cannabis was included. This might have led to an overestimation of the actual average age. One respondent has 1 missing value in the EPQ scale. The directive of the Dutch EPQ on how to handle missing values states that the mean of the other values has to be substituted in the missing value. The maximum number of missing values for the short version of the EPQ in the extraversion scale is 2 (Sanderman, Arrindell & Ranchor, 1995). Polysubstance use had to be an open question where people could fill in the drugs due to limitations with the survey tool. Sometimes people reported one drug combination with the first drug but not with the second drug. This could have led to an underestimation of the actual used combinations. Some students reported the combinations with nitrous oxide as polysubstance use; however, it was not possible to report these combinations because it was not asked. The number of students that used psilocybin mushrooms might have been underestimated, for this was not included in the list of drugs. One person reported it with other drugs, but others could have forgotten to report it since it was not listed.

## Conclusions

A large number of factors are associated with the different outcome variables. More research needs to be done to prevent polysubstance use and combining alcohol with drugs. Interventions and policy strategies can be used for selected- and indicated- prevention. Sex, the frequency of visits to bars, AUDIT and its three questions, the ever prevalence of smoking, drug availability, the amount of drug using friends, the ever prevalence of nitrous oxide, importance of religion and extraversion were the most important factors that were found. Predicting the onset of drug use can be done by looking into the living situation in the weekend, the frequency of visits to dance events, the frequency of alcohol consumption, the occurrence of smoking, the use of nitrous oxide the drug availability and the media influence. Polysubstance use and combining alcohol with drugs needs to be prevented. 36% of students in the research population engages in polysubstance use and 60% of them drinks while using alcohol. A lot of health incidences are caused by a combination of drugs or alcohol, so prevention is important.

# References

- van Amsterdam, J., Opperhuizen, A., & van den Brink, W. (2011). Harm potential of magic mushroom use: a review. *Regulatory Toxicology and Pharmacology*, 59(3), 423-429.
- Barrett, S. P., Darredeau, C., & Pihl, R. O. (2006). Patterns of simultaneous polysubstance use in drug using university students. *Human Psychopharmacology: Clinical and Experimental*, 21(4), 255-263.
- Boys, A., Masden, J., Strang, J. (2001). Understanding reasons for drug use amongst young people: a functional perspective. *Health Educ Res* (2001) 16 (4): 457-469.
- Bush, K., Kivlahan, D. R., McDonell, M. B., Fihn, S. D., & Bradley, K. A. (1998). The AUDIT alcohol consumption questions (AUDIT-C): an effective brief screening test for problem drinking. *Archives of internal medicine*, 158(16), 1789-1795.
- Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS Scales. *Journal of personality and social psychology*, 67(2), 319.
- Chan, G. C. K., Kelly, A. B., Carroll, A., Williams, J. W. (2017). Peer drug use and adolescent polysubstance use: Do parenting and school factors moderate this association? *Addictive behaviors*. 64: 78-81
- Deady, M. (2009). A review of screening, assessment and outcome measures for drug and alcohol settings. *Drug and Alcohol and Mental Health Information Management Project*. Sydney: NSW Department of Health.
- Degenhardt, L., & Hall, W. (2012). Extent of illicit drug use and dependence, and their contribution to the global burden of disease. *The Lancet*, 379(9810), 55-70.
- Dorsselaer, S., Goossens, F. X. (2015). *Alcohol-, tabaks- en drugsgebruik door studenten: Inventarisatie van (onderzoeken naar) prevalentieschattingen onder MBO-, HBO- en WO-studenten in Nederland*. Utrecht. Trimbos-instituut.
- Dorsselaer, van S., Tuithof, M., Verdurmen, J., Spit, M., Laar, van M., Monshouwer, S. (2015). *Jeugd en riskant gedrag 2015*. Utrecht. Trimbos-instituut.
- Farré, M., De la Torre, R., Llorente, M., Lamas, X., Ugena, B., Segura, J., & Camí, J. (1993). Alcohol and cocaine interactions in humans. *Journal of Pharmacology and Experimental Therapeutics*, 266(3), 1364-1373.
- Franken, I. H., Muris, P., & Rassin, E. (2005). Psychometric properties of the Dutch BIS/BAS scales. *Journal of Psychopathology and Behavioral Assessment*, 27(1), 25-30.
- Franken, I. H., & Muris, P. (2006). BIS/BAS personality characteristics and college students' substance use. *Personality and Individual Differences*, 40(7), 1497-1503.

- Fu, S., & Stojanovska, N. (2015). Designer Drugs. *Forensic Chemistry*, 167.
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: a research note. *Journal of child psychology and psychiatry*, 38(5), 581-586.
- Goor, M. (2015). *De stand van zaken rond XTC*. Retrieved February 16, 2017 retrieved from <https://assets.trimbos.nl/docs/6fcedbde-f079-4551-a8c9-ba111f7b7773.pdf>
- Van Hal, G., Rosiers, J., Bernaert, I., & Hoeck, S. (2007). *In hogere sferen. Een Onderzoek naar het Middelengebruik bij Antwerpse Studenten*. Antwerp: University of Antwerp.
- Hasselt van, N. (2010). *Preventie van schadelijk alcoholgebruik en drugsgebruik onder jongeren*. Trimbos-instituut.
- Hearn, W. L., Rose, S., Wagner, J., Ciarleglio, A., & Mash, D. C. (1991). Cocaethylene is more potent than cocaine in mediating lethality. *Pharmacology Biochemistry and Behavior*, 39(2), 531-533.
- Van der Heijde, C. M., Vonk P., & Meijman, F. J., (2015) Selfregulation for the promotion of student health. Traffic lights: the development of a tailored webbased instrument providing immediate personalized feedback, *Health Psychology and Behavioral Medicine: An Open Access Journal*, 3:1, 169-189
- Jellinek. *Hoe komen mensen aan drugs?* (2016). Retrieved Oktober 20, 2016, from <https://www.jellinek.nl/vraag-antwoord/hoe-komen-mensen-aan-drugs/>
- Jellinek. (17 augustus, 2016). *Waarom zijn drugs schadelijk voor het lichaam?* Retrieved February 9, 2017, from <https://www.jellinek.nl/vraag-antwoord/waarom-zijn-drugs-schadelijk-voor-het-lichaam/>
- Jorm, A. F., Christensen, H., Henderson, A. S., Jacomb, P. A., Korten, A. E., & Rodgers, B. (1998). Using the BIS/BAS scales to measure behavioural inhibition and behavioural activation: Factor structure, validity and norms in a large community sample. *Personality and Individual Differences*, 26(1), 49-58.
- Kendler, K. S., Ohlsson, H., Sundquist, K., Sundguis, J. (2013). *Within-Family Environmental Transmission of Drug Abuse*. *JAMA Psychiatry*, 70(2): 235.-242.
- Laar van, M.W., Ooyen-Houben van, M.M.J. (2016). *Nationale Drug Monitor*. Trimbos-Instituut.
- Linsen, F., Koning, R. P. J., van Laar, M., Niesink, R. J. M., Koeter, M. W., Brunt, T. M. (2015). *4-Fluoroamphetamine in the Netherlands: more than a one-night stand*. Addiction, in press.
- Loketgezondleven. *Mogelijke Oorzaken Van Drugsgebruik*. (2016). Retrieved November 7, 2016, from <https://www.loketgezondleven.nl/gezonede-gemeente/drugs/cijfers-en-feiten/mogelijke-oorzaken-van-drugsgebruik>
- Lynskey MT, Heath AC, Bucholz KK, Slutske WS, Madden PAF, Nelson EC, Statham DJ, Martin NG. *Escalation of drug use in early-onset cannabis users vs co-twin controls*. *JAMA* 289:427-33, 2003.
- Makowska, Z., Merecz, D., Moscicka, A., & Kolasa, W. (2002). The validity of general health questionnaires, GHQ-12 and GHQ-28, in mental health studies of working people. *International journal of occupational medicine and environmental health*, 15(4), 353-362.
- Marsh, H. W., Relich, J. D., & Smith, I. D. (1983). Self-concept: The construct validity of interpretations based upon the SDQ. *Journal of Personality and social psychology*, 45(1), 173.

Martsh, C. T., & Miller, W. R. (1997). Extraversion predicts heavy drinking in college students. *Personality and Individual Differences*, 23(1), 153-155.

Monshouwer K, van Dorsselaer S, Verdurmen JEE, Vollebergh WWAM. (2011). *Het gebruik van alcohol, tabak en drugs onder Nederlandse scholieren vergeleken met de rest van Europa*. Utrecht. Trimbos-instituut.

Nabben, T., Koet, S. & Korf, D. (2007). *NL.Trendwatch. Gebruikersmarkt uitgaansdrugs in Nederland 2006-2007*. Amsterdam: Rozenberg Publishers

Nationaal Kompas. *Wat zijn de mogelijke oorzaken van drugsgebruik* (n.d.). Retrieved Oktober 20, 2016, from  
<http://www.nationaalkompas.nl/gezondheidsdeterminanten/leefstijl/alcoholgebruik/wat-zijn-de-mogelijke-oorzaken-van-alcoholgebruik/>

National institute on drug abuse. (2014). *Drugs, brains, and behavior: The science of addiction*. NIH 14-5605.

Needle, R., McCubbin, H., Wilson, M., Reineck, R., Lazar, A., & Mederer, H. (1986). Interpersonal influences in adolescent drug use—the role of older siblings, parents, and peers. *International Journal of the Addictions*, 21(7), 739-766.

Newbury-Birch, D., White, M., & Kamali, F. (2000). Factors influencing alcohol and illicit drug use amongst medical students. *Drug and alcohol dependence*, 59(2), 125-130.

Novacek, J., Raskin, R., Hogan, R. (1991). *Why do adolescents use drugs? Age, sex, and user differences*. *Journal of Youth and Adolescence* 20: 475.

Nutt, D. J., King, L. A., & Nichols, D. E. (2013). Effects of Schedule I drug laws on neuroscience research and treatment innovation. *Nature Reviews Neuroscience*, 14(8), 577-585.

Nutt, DJ, King, LA, Phillips, LD. (2010). *Drug harms in the UK: a multicriteria decision analysis*. Lancet

Pol van, P., Laar van, M. (2014). *Kerncijfers drugsgebruik 2014*. Trimbos-Instituut.

Rijksoverheid. (n.d.). *Wet maakt verschil tussen harddrugs en softdrugs*. Retrieved February 16, 2017, from <https://www.rijksoverheid.nl/onderwerpen/drugs/inhoud/wet-maakt-verschil-harddrugs-en-softdrugs>

Robertson, E.B.; David, S.L.; and Rao, S.A. *Preventing Drug Use among Children and Adolescents: A Research-Based Guide for Parents, Educators, and Community Leaders*, 2nd ed. NIH Pub. No. 04-4212(A). Bethesda, MD: National Institute on Drug Abuse, 2003. Available at: [www.drugabuse.gov/pdf/prevention/RedBook.pdf](http://www.drugabuse.gov/pdf/prevention/RedBook.pdf)

Rosenbaum, D. P., & Hanson, G. S. (1998). Assessing the effects of school-based drug education: A six-year multilevel analysis of project DARE. *Journal of research in crime and delinquency*, 35(4), 381-412.

Sanderman, R., Arrindell, W. A., & Ranchor, A. V. (1995). Het meten van persoonlijkheidskenmerken met de Eysenck Personality Questionnaire (EPQ): Een handleiding. *Groningen: Noordelijk Centrum voor Gezondheidsvraagstukken*.

Skinner, H. (1982). *The drug abuse screening test*. *Addictive Behaviors*, 7, 363–371.

Steinberg, L., & Monahan, K. C. (2007). Age differences in resistance to peer influence. *Developmental psychology, 43*(6), 1531.

Sumter, S. R., Bokhorst, C. L., Steinberg, L., & Westenberg, P. M. (2009). The developmental pattern of resistance to peer influence in adolescence: Will the teenager ever be able to resist?. *Journal of adolescence, 32*(4), 1009-1021.

Trimbos-instituut. (2015). *Monitor drugsincidenten factsheet 2015*. Retrieved February 17, 2017 from: <https://assets.trimbos.nl/docs/eb36c36b-f945-49f6-ad06-4cd56659a4f0.pdf>

Trimbos-instituut. (2016). *Nationale drug monitor*. Retrieved May 30, 2017 from: <https://assets.trimbos.nl/docs/24dd30ba-464f-4dcd-a740-20ac058d310b.pdf>

Twisk, J. W. R. (2014). *Inleiding in de toegepaste biostatistiek*. Reed Business Education.

Verdurmen JEE, van Dorsselaer S, Monshouwer K. Middelengebruik onder studenten van 16-18 jaar op het MBO en HBO 2015. Utrecht: Trimbos-instituut; 2016.

VolksgezondheidZorg. (2017). *Afhankelijkheid van drugs: Kosten van zorg voor afhankelijkheid alcohol en drugs* Retrieved February 8, 2017, from <https://www.volksgezondheidenzorg.info/onderwerp/afhankelijkheid-van-drugs/kosten#!node-kosten-van-zorg-voor-afhankelijkheid-van-alcohol-en-drugs>

VolksgezondheidZorg. *Gevolgen van gebruik harddrugs* (2017). Retrieved February 9, 2017, from <https://www.volksgezondheidenzorg.info/onderwerp/drugsgebruik/cijfers-context/gevolgen#!node-gevolgen-van-gebruik-harddrugs>

Whitaker, L. R., Degoulet, M., Morikawa, H. (2013). *Social deprivation enhances VTA synaptic plasticity and drug-induced contextual learning*. Neuron, 77(2), 335-345.

White, H.P., McMorris, B.J., Catalano, R.F., Fleming, C.B., Haggerty, K.P., Abbott, R. (2008). *Increases in Alcohol and Marijuana Use During the Transition Out of High School Into Emerging Adulthood: The Effects of Leaving Home, Going to College, and High School Protective Factors*. J Stud Alcohol. 67(6): 810–822.

Widenfelt, B. V., Goedhart, A., Treffers, P. A., & Goodman, R. (2003). Dutch version of the Strengths and Difficulties Questionnaire (SDQ). *European child & adolescent psychiatry, 12*(6), 281-289.

Wilson, L. D., Jeromin, J., Garvey, L., & Dorbandt, A. (2001). Cocaine, ethanol, and cocaethylene cardiotoxicity in an animal model of cocaine and ethanol abuse. *Academic Emergency Medicine, 8*(3), 211-222.

Yudko, E., Lozhkina, O., and Fouts, A. (2007). *A comprehensive review of the psychometric properties of the drug abuse screening test*. *Journal of Substance Abuse Treatment, 32*, 189–198.

Zandstra, P., NRC. Designerdrug 4-FA wordt per 1 april verboden (2016). Retrieved February 9, 2017, from <https://www.nrc.nl/nieuws/2016/12/07/designerdrug-4-fa-wordt-per-1-april-verboden-a1535470>

# Reflection

I learned a lot from this internship. Making the questionnaire took a lot longer than I initially expected. Searching for the validated research tools was harder than I thought, and it takes a lot more thought than I expected. It also took a lot longer to find respondents. I did not always get the guidance that I hoped I would, but this made me work more independently. It helped me to really try and find the answer myself before asking for help. Sometimes it surprised me how much I figured out by myself. I think that in hindsight I might have taken too much on my plate. I chose to do different outcome variables causing me to do a lot more analysis than would have been sufficient. This caused that I could not go into the results very thoroughly, but since it was still relevant to study polysubstance use and combining alcohol with drugs, I decided to keep it. Before I started this research, I could not efficiently estimate where the difficulties would be, and how much time the different components would take me. Sometimes I struggled with having an extern internship with so many different people who are involved. My onsite supervisor, VU supervisor, the Belgian researchers, the general practitioner's director and my internship coordinator did not always agree with each other. I found it hard to keep everyone happy and still make my own decisions. Sometimes I had to push through and fight for what I thought would be best. I have never been in a situation with so many conflicts of interests and I do think that I did my best to meet everyone's needs while still deciding what's best for the research. When I started this research I did not think that I had enough knowledge about research to do one myself, however with a lot of literature research and some help I think that I can be proud at the result. I am confident that next time I have to do a research it would have a lot less bumps on the road. I found myself doing the same analysis over and over again because there was something I did not do the right way. At the end I felt like I had too little time too do everything the way I wanted it. I know that usually students have 1 outcome variable, and I know that if I had fewer outcome variables, I would have done a much better job at the results that I have, and to think about the relevance of the study. In hindsight I should probably have started with 1 or 2 outcome variables and do more if I had time to spare. I feel like next time I know better how to start, and to do things right the first time. However, I do am proud of myself with what I have produced. I think that my ambition for this project has shown and that I found some interesting results.

# Appendices

## Survey

Wat is je leeftijd?

Wat is je geslacht?

- Man
- Vrouw

Studeer je in Nederland?

- Ja
- Ja, maar ik studeer tijdelijk in het buitenland
- Nee

Woon je in een stad?

- Ja, ik woon in Amsterdam
- Ja, ik woon in een andere stad dan Amsterdam
- Nee, maar ik woon rondom een stad
- Nee, ik woon niet vlakbij een stad

Wat voor opleiding volg je?

- MBO
- HBO
- WO Bachelor
- WO Master
- PHD
- Ik studeer niet
- Anders

Op welke manier volg je je studie?

- Voltijd
- Deeltijd
- Thuisstudie
- Anders

Wat is je woonsituatie doordeweeks?

- Ik woon zelfstandig
- Ik woon in een studentenhuis of met vrienden
- Ik woon samen met een partner
- Ik woon thuis bij mijn ouders
- Anders

Wat is je woonsituatie in het weekend?

- Ik woon op zelfstandig
- Ik woon in een studentenhuis of met vrienden
- Ik woon samen met een partner
- Ik woon thuis bij mijn ouders
- Anders

Ben je lid van een studentenvereniging?

- Ja
- Nee
- Nee, maar ik ben wel actief bij een studievereniging

Wat is de relatie tussen je biologische ouders?

- Ze zijn getrouwd en wonen samen
- Ze zijn niet getrouwd en wonen samen
- Ze zijn gescheiden en wonen niet samen
- Ze hebben nooit samengewoond
- Mijn moeder en/of vader is overleden
- Andere

Wat is je religieuze overtuiging?

- Christelijk
- Islamitisch
- Joods
- Hindoeïstisch
- Boeddhistisch
- Ik heb geen religieuze overtuiging
- Anders

Hoe belangrijk is religie in je leven?

- Helemaal niet belangrijk
- Eerder niet belangrijk
- Niet belangrijk niet onbelangrijk
- Eerder belangrijk
- Heel belangrijk

Hoe vaak bezoek je de volgende aangelegenheden?

Niet / Minder dan 1 keer per maand / 1 keer per maand / 2-3 keer per maand / 1 keer per week / 2 keer per week / 3-4 keer per week / 5-6 keer per week / Dagelijks

Dance events

Clubs

Bars/ cafés

Borrel van een studie/studentenvereniging

Ben je in de laatste 12 maanden meer naar clubs en bar gegaan dan 12 maanden geleden?

- Ja, ik ben meer uitgegaan
- Nee, ik ben minder uitgegaan
- Het is gelijk gebleven

Ben je in de laatste 12 maanden meer naar dance events geweest dan 12 maanden geleden?

- Ja, ik ben meer naar dance events gegaan
- Nee, ik ben minder naar dance events gegaan
- Het is gelijk gebleven

Hoevaak drink je alcohol?

- Ik drink geen alcohol
- (minder dan) elke maand

- (minder dan) 1x per week
- 2 a 3 keer per week
- 4x per week of meer

Als je alcohol drinkt, hoeveel standaardglazen drink je dan gemiddeld per gelegenheid?

- 1 of 2
- 3 of 4
- 5 of 6
- 7 tot 9
- 10 of meer

Hoe vaak gebeurt het dat je 6 of meer glazen alcohol drinkt bij één enkele gelegenheid?

- Nooit
- Minder dan maandelijks
- Maandelijks
- Wekelijks
- Dagelijks of bijna dagelijks

Heb je ooit gerookt (tabak of sigaretten)?

- Ja
- Nee

Heb je in de afgelopen 12 maanden sigaretten of tabak gerookt?

- Ja
- Nee
- Alleen bij gelegenheden

Hoeveel rook je per dag (sigaretten of tabak)?

- 10 of minder
- 11 tot 20
- 21 tot 30
- 31 of meer

Met stimulerende medicatie bedoelen we de volgende voorschriftplichtige geneesmiddelen:

- 1) methylfenidaat (bv. Concerta®, Rilatine®, Medikinet®, Equasym XR®, ...)
- 2) modafinil (bv. Provigil®)

Heb je ooit stimulerende medicatie gebruikt?

- Ja
- Nee

Heb je de afgelopen 12 maanden stimulerende medicatie gebruikt?

- Ja
- Nee

Hoe vaak gebruik je stimulerende medicatie? (1 antwoord per rij)

						Niet	Minder dan 1 keer per maand	1 keer per maand	2-3 keer per maand	1 keer per week	2 keer per week	3-4 keer per week	5-6 keer per week	Dagelijks
LESPERIODES: van de eerste tot de laatste lesdag (incl. stages)						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
BLOKPERIODES: van de laatste lesdag tot het eerste examen						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EXAMENPERIODES: van het eerste examen tot het laatste examen						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Heb je ooit stimulerende medicatie gebruikt in het kader van een behandeling (bv. ADHD, ADD,...)?

- Nooit
- Uiterst zelden
- Zelden
- Soms
- Af en toe
- Regelmatig
- Vaak

Heb je de afgelopen 12 maanden tijdens jouw opleiding stimulerende medicatie gebruikt in het kader van een behandeling (bv. ADHD, ADD,...)?

- Nooit
- Uiterst zelden
- Zelden
- Soms
- Af en toe
- Regelmatig
- Vaak

Ben je ooit gediagnosticeerd met ADHD of ADD?

- Nee
- Nee, maar ik denk wel dat ik het heb
- Ja

Heb je ooit stimulerende medicatie gebruikt om jouw studieprestaties te verbeteren (bv. Om beter te studenten voor de examens, om wakker te blijven voor stage, enz.) zonder dat dit gebruik kaderde in een behandeling (bv. ADHD, ADD, ...)?

- Nooit
- Uiterst zelden
- Zelden
- Soms
- Af en toe
- Regelmatig
- Vaak

Op welke leeftijd heb je voor het eerst stimulerende medicatie gebruikt om jouw studieprestaties te verbeteren (bv. Om beter te studenten voor de examens, om wakker te blijven voor stage, enz.) zonder dat dit gebruik kaderde in een behandeling?

Hoe vaak heb je de voorbije 12 maanden stimulerende medicatie gebruikt om jouw studieprestaties te verbeteren (bv. om beter te studeren voor de examens, om wakker te blijven voor jouw stage...), zonder dat dit gebruik kaderde in een behandeling (bv. ADHD, ADD, ...)? (1 antwoord per rij)

						Niet	Minder dan 1 keer per maand	1 keer per maand	2-3 keer per maand	1 keer per week	2 keer per week	3-4 keer per week	5-6 keer per week	Dagelijks
LESPERIODES: van de eerste tot de laatste lesdag (incl. stages)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
BLOKPERIODES: van de laatste lesdag tot het eerste examen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
EXAMENPERIODES: van het eerste examen tot het laatste examen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						

Heb je door inname van stimulerende medicatie het gewenste effect gekregen?

- Nooit
- Uiterst zelden
- Zelden
- Soms
- Af en toe
- Regelmatig
- Vaak

Via welke weg heb je de stimulerende medicatie verkregen om jouw studieprestaties te verbeteren? (Meerdere antwoorden zijn mogelijk)

- Via een voorschrijf van de huisarts
- Via een voorschrijf van de psychiater/neuroloog
- Mezelf voorgescreven
- Voorschrijf gestolen
- Medicatie gestolen
- Via een bestelling op een website
- Via een kennis/vriend binnen het studentenmilieu (school of studentenclub)
- Via een kennis/vriend buiten het studentenmilieu
- Via mijn ouders
- Via mijn broer/zus
- Via een ander familielid
- Andere

Is een van jouw ouders arts?

Ja

Nee

In hoeverre ben je het eens met volgende stellingen? (1 antwoord per rij)

	Helemaal niet akkoord	Niet akkoord	Noch akkoord, noch niet akkoord	Akkoord	Helemaal akkoord
Ik ben me bewust van de aanbevolen dosissen van stimulerende medicatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik ben me bewust van wat er met mijn lichaam kan gebeuren als ik stimulerende medicatie gebruik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik heb kennis over de bijwerkingen van stimulerende medicatie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik ben van plan stimulerende medicatie te nemen om mijn leerprestaties te verbeteren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(Antwoord schaal veranderd naar: Helemaal niet mee eens, niet mee eens, niet mee eens niet mee oneens, mee eens en helemaal mee eens)

Heb je ooit lachgas gebruikt?

- Ja
- Nee

Hoe vaak gebruik je lachgas?

- Minder dan jaarlijks
- Jaarlijks
- Elk half jaar
- Om de maand
- Maandelijks
- Wekelijks
- Dagelijks

Heb je in de afgelopen 12 maanden lachgas gebruikt?

- Ja
- Nee
- Weet ik niet meer

Heb je ooit drugs gebruikt?

- Ja
- Nee

Welke drugs heb je ooit gebruikt?

- Wiet/ hasj
- XTC/MDMA
- 4FMP
- Cocaïne
- GHB
- Amfetaminen (speed/pep)
- Ketamine
- LSD
- Opiaten
- Truffels

- Fentanylamine (2CB, 2CE)
- Poppers
- Niet voorgeschreven slaap en kalmeringsmiddelen (bezodiazepines zoals bv. Valium of seresta)
- Crack cocaine
- Methamfetamine
- Heroïne

Anders, namelijk:

Wat is de volgorde dat je deze drugs gebruikte?

Denk je dat je minder 4fmp gaat gebruiken nu het niet meer legaal is?

- Ja
- Nee

Hoe vaak gebruik je deze drugs?

- Niet
- Minder dan jaarlijks
- Jaarlijks
- Elk half jaar
- Om de maand
- Maandelijks
- Wekelijks
- Dagelijks

Hoe vaak gebruikte je deze drugs 12 maanden geleden?

- Niet
- Minder dan jaarlijks
- Jaarlijks
- Elk half jaar
- Om de maand
- Maandelijks
- Wekelijks
- Dagelijks

Heb je wel eens meerdere drugs door elkaar gebruikt?

- Ja
- Nee

Welke drugs heb je wel eens door elkaar gebruikt?

Kan je makkelijk in het bezit van drugs komen?

- Ja
- Nee

Op welke manier verkrijg je meestal je drugs?

- Via vrienden
- Via een vaste dealer
- Via een onbekende dealer
- Van het internet
- In een smartshop

Hoeveel rekening hou je met ongelukken die tijdens het gebruik van drugs kunnen voorkomen?  
(zoals bijvoorbeeld watervergiftiging bij XTC gebruik en verkeersongelukken bij gebruik van LSD)

- Niet
- Niet zo veel
- Redelijk veel
- Veel
- Heel veel

In hoeverre hou je rekening met het optreden van verslaving door drugs bij het gebruik ervan?

- Niet
- Niet zo veel
- Redelijk veel
- Veel
- Heel veel

In hoeverre hou je rekening met het negatieve effect van drugs op je gezondheid?

- Niet
- Niet zo veel
- Redelijk veel
- Veel
- Heel veel

In hoeverre ben je het eens met de volgende stelling: 'Ik heb een gezonde leefstijl'?

- Heel erg eens
- Eens
- Niet eens, niet oneens
- Oneens
- Heel erg oneens

Gebruik je wel eens drugs in je eentje?

- Ja
- Nee

Hoe vaak gebruik je drugs in je eentje?

- Nooit
- Zelden
- Regelmatig
- Vaak
- Heel vaak

Welke drugs gebruik je wel eens in je eentje?

- Wiet/ hasj
- XTC/MDMA
- 4FMP
- Cocaïne
- GHB
- Amfetaminen (speed/pep)
- Ketamine
- LSD
- Opiaten
- Truffels

- Fentanylamine (2CB, 2CE)
- Poppers
- Slaap en kalmeringsmiddelen (bezodiazepines zoals bv. Valium of seresta)
- Crack cocaine
- Methamfetamine
- Heroine

Anders, namelijk:

Zie je vaak drugsgebruik op TV, films en social media?

- Nooit
- Zelden
- Regelmäßig
- Vaak
- Heel vaak

Hoe denk je dat de media het gebruik van drugs er probeert uit te laten zien?

- Als iets goeds om te doen
- Als iets slechts om te doen
- Zowel als iets goeds als iets slechts om te doen
- Neutraal

Heb je familieleden die te maken hebben gehad met een verslaving? (alcohol of drugs)

- Ja
- Nee
- Weet ik niet

Heb je een familielid die drugs gebruikt of heeft gebruikt?

- Ja, een broer of zus
- Ja, mijn ouders
- Ja, andere familie
- Nee, ik heb geen familieleden die drugs gebruiken
- Weet ik niet

Wordt er in jouw familie vaak alcohol gedronken?

- Nooit
- Zelden
- Regelmäßig
- Vaak
- Heel vaak

Ben je meer drugs gaan gebruiken toen je ging studeren?

- Ja
- Nee

Hoe oud was je toen je voor het eerst drugs gebruikte?

Wat is de volgorde van drugs die je bent gaan gebruiken?

In hoeverre ben jij het eens met de volgende stelling? 'Ik gebruik wel eens drugs omdat het goedkoper is dan een avondje drinken'

- Heel erg eens
- Eens
- Niet eens, niet oneens
- Oneens
- Heel erg oneens

Drink je wel eens alcohol als je drugs gebruikt?

- Ja
- Nee

Hoeveel standaardglazen alcohol drink je gemiddeld bij deze drugs?

Hoeveel vrienden heb je die drugs gebruiken?

- Geen vrienden gebruiken drugs
- Een paar vrienden gebruiken drugs
- Veel vrienden gebruiken drugs

Heb je het afgelopen jaar meer drugs gebruikt dan in het jaar daarvoor?

- Ja
- Nee

Heb je het afgelopen jaar meer stress ondervonden dan in het jaar daarvoor?

- Ja
- Nee

Hoe vaak ben je bezorgd, angstig of twijfel je aan je capaciteiten bij...?

Stress maat

	Nooit	Zelden	Soms	Vaak	Zeer vaak
...persoonlijke relaties	<input type="radio"/>				
...familiale aangelegenheden	<input type="radio"/>				
...financiële zaken	<input type="radio"/>				
...studie gerelateerde zaken	<input type="radio"/>				
...zaken met betrekking tot je huisvesting	<input type="radio"/>				
...niet meer thuis wonen	<input type="radio"/>				
...het aanpakken van moeilijkheden	<input type="radio"/>				
...het bereiken van je persoonlijke doelstellingen	<input type="radio"/>				
...gebeurtenissen die niet volgens plan verlopen	<input type="radio"/>				
...niet langer de controle hebben	<input type="radio"/>				
...overweldigd zijn door problemen	<input type="radio"/>				

Hoe is het gesteld met jouw algehele gezondheid?

- Heel erg goed
- Erg goed
- Goed
- Redelijk
- Slecht

Dast-10 (drug abuse screening test)  
Nooit/ Soms/ Regelmatig/ Vaak/ Heel vaak

Kun je stoppen met druggebruik als je dat wilt?  
Heb je blackouts of flashbacks door druggebruik?  
Voel je je soms rot over je drugsgebruik?  
Klaagt je partner (of familie) ooit over je druggebruik?  
Heb je je familie verwaarloosd of school en/of werk gemist door drugsgebruik?  
Heb je ooit afkickverschijnselen gehad door zwaar druggebruik?  
Heb je problemen gehad met je gezondheid door je druggebruik? (b.v. geheugenverlies, hepatitis, stuipen, bloedingen, etc.)?

Bis/Bas scale (anticipation of punishment, the drive scale, fun seeking and the reward responsiveness)  
Helemaal mee oneens/ Beetje mee eens/ Beetje mee oneens/ Helemaal eens

Ik voel zelden angst of zenuwen, zelfs als me iets vervelends staat te wachten  
Als ik iets goed doe, wil ik er graag mee doorgaan  
Ik ben altijd bereid iets nieuws te proberen als ik denk dat het leuk zal zijn  
Als ik krijg wat ik wil, voel ik me opgewonden en energiek  
Kritiek of uitbranders raken mij behoorlijk  
Als ik iets wil, zal ik er gewoonlijk alles aan doen om dit te krijgen  
Vaak doe ik dingen alleen voor de lol  
Als ik de kans zie iets te krijgen wat ik wil, zal ik die kans meteen grijpen  
Ik voel me bezorgd of overstuur als ik denk of weet dat iemand boos op mij is  
Als ik ergens een buitenkansje zie dan word ik meteen enthousiast  
Ik doe vaak dingen in een vlaag van opwelling  
Ik raak enigszins gestrest als ik denk dat er iets vervelends staat te gebeuren  
Als ik iets leuks meemaak heeft dat duidelijk invloed op me  
Ik voel me bezorgd als ik denk dat ik slecht heb gepresteerd  
Ik verlang naar spanning en sensatie  
Als ik iets van plan ben dan laat ik mij door niets weerhouden  
Ik ervaar weinig angsten vergeleken met mijn vrienden  
Als ik een wedstrijd zou winnen, zou ik erg enthousiast zijn  
Ik pieker wel eens over het maken van fouten

Bis  
Bas Drive  
Bas Fun seeking  
Bas Reward responsiveness

EPQ Extraversie subscale

Bent u een spraakzaam persoon? ja nee  
Bent u een levendig persoon? ja nee  
Vindt u het prettig om nieuwe mensen te ontmoeten? ja nee  
Kunt u zich meestal op een levendig feest uitleven en er geheel van genieten? ja nee  
Bent u degene die meestal het initiatief neemt bij het maken van nieuwe vrienden? ja nee

Kunt u gemakkelijk wat leven in een nogal saai feestje brengen? ja nee  
Vindt u het prettig om in contact met mensen te komen? ja nee  
Vindt u het prettig om veel drukte en opwinding om u heen te hebben? ja nee  
Vinden anderen u een levendig persoon? ja nee  
Kunt u een feest op gang brengen? Ja nee  
Bent u meestal stil als u in een gezelschap bent? ja nee  
Bent u iemand die geneigd is zich op de achtergrond te houden tijdens sociale evenementen (bijv. op feestjes)? ja nee

**GHQ-12-subschaal angst en depressie (Mental health)**

Helemaal niet/ niet meer dan gewoonlijk/ wat meer dan gewoonlijk/veel meer dan gewoonlijk

Ben je de laatste tijd door zorgen veel slaap tekort gekomen?  
Heb je de laatste tijd het gevoel gehad dat je voortdurend onder druk stond?  
Heb je de laatste tijd het gevoel gehad dat je je moeilijkheden niet te baas kon?  
Heb je je de laatste tijd ongelukkig en neerslachtig gevoeld?

**Gevalideerde vragen uit Belgie**

Helemaal mee eens/ Niet mee eens/  
neutraal/ mee eens/ Helemaal mee eens

**ADHD symptomen:**

Het is moeilijk voor mij om op te letten tijdens colleges  
Het is moeilijk voor mij om me te concentreren op academische taken en/of papers  
Ik heb moeilijkheden met het bijhouden van taken en/ of papers  
Ik voel me vaak rusteloos  
Ik ben een impulsief persoon  
Ik plan zelden vooruit

**Uitstelgedrag:**

Ik stel het afwerken van taken nodeloos uit, ook al zijn ze belangrijk  
Wanneer ik een deadline heb, wacht ik tot de laatste minuut  
Ik slaag erin om een excus te vinden om iets niet te doen  
Ik ben een onverbeterlijke tijdsverspiller

**Faalangst:**

Als iemand een opdracht beter doet dan ik, op het werk / op school, dan voelt het alsof ik gefaald heb voor de hele opdracht  
Als ik niet even goed doe als een ander, dan betekend dit dat ik een minderwaardig mens ben  
Als ik niet de hele tijd het goed doe, dan zullen mensen me niet meer respecteren  
Hoe minder fouten ik maak, hoe meer mensen me graag zullen hebben

**Lees de volgende stellingen. Bekijk eerst of je meer lijkt op de mensen van de eerste stelling of van de tweede stelling en bekijk vervolgens in welke mate je het met die stelling eens bent.**

Sommige mensen doen altijd mee met hun vrienden alleen maar om hun vrienden blij te maken.

**MAAR**

Andere mensen doen niet altijd mee met hun vrienden, ook al weten ze dat hun vrienden dat niet leuk zullen vinden.

De eerste stelling is helemaal waar voor mij

De eerste stelling is een beetje waar voor mij  
De tweede stelling is helemaal waar voor mij  
De tweede stelling is een beetje waar voor mij

Sommige mensen vinden het belangrijker om een individu te zijn dan om zich aan te passen aan de groep.

MAAR

Andere mensen vinden het belangrijker om zich aan te passen aan de groep dan om een individu te zijn.

De eerste stelling is helemaal waar voor mij  
De eerste stelling is een beetje waar voor mij  
De tweede stelling is helemaal waar voor mij  
De tweede stelling is een beetje waar voor mij

Sommige mensen laten zich gemakkelijk door hun vrienden op andere gedachten brengen.

MAAR

Andere mensen laten zich niet gemakkelijk door hun vrienden op andere gedachten brengen.

De eerste stelling is helemaal waar voor mij  
De eerste stelling is een beetje waar voor mij  
De tweede stelling is helemaal waar voor mij  
De tweede stelling is een beetje waar voor mij

Sommige mensen doen dingen waarvan ze weten dat het verkeerd is, alleen maar om vrienden te blijven.

MAAR

Andere mensen doen geen dingen waarvan ze weten dat het verkeerd is, alleen maar om vrienden te blijven.

De eerste stelling is helemaal waar voor mij  
De eerste stelling is een beetje waar voor mij  
De tweede stelling is helemaal waar voor mij  
De tweede stelling is een beetje waar voor mij

Sommige mensen zeggen niet wat ze vinden, als ze denken dat hun vrienden hen daarom zullen uitlachen.

MAAR

Andere mensen zeggen wel wat ze vinden, ook al weten ze dat hun vrienden hen daarom zullen uitlachen.

De eerste stelling is helemaal waar voor mij  
De eerste stelling is een beetje waar voor mij  
De tweede stelling is helemaal waar voor mij  
De tweede stelling is een beetje waar voor mij

Sommige mensen zullen de wet niet overtreden alleen maar omdat hun vrienden zeggen dat zij dat wel zouden doen.

MAAR

Andere mensen zouden de wet wel overtreden wanneer hun vrienden zeggen dat zij dat wel zouden doen.

De eerste stelling is helemaal waar voor mij  
De eerste stelling is een beetje waar voor mij  
De tweede stelling is helemaal waar voor mij  
De tweede stelling is een beetje waar voor mij

Sommige mensen gedragen zich heel anders als ze bij hun vrienden zijn.

MAAR

Andere mensen gedragen zich niet anders als ze bij hun vrienden zijn.

De eerste stelling is helemaal waar voor mij  
De eerste stelling is een beetje waar voor mij

De tweede stelling is helemaal waar voor mij  
De tweede stelling is een beetje waar voor mij

Sommige mensen nemen meer risico's wanneer ze met hun vrienden zijn dan wanneer ze alleen zijn.  
**MAAR**

Andere mensen nemen niet meer risico's wanneer ze met vrienden zijn dan wanneer ze alleen zijn.

De eerste stelling is helemaal waar voor mij  
De eerste stelling is een beetje waar voor mij  
De tweede stelling is helemaal waar voor mij  
De tweede stelling is een beetje waar voor mij

Sommige mensen zeggen dingen die ze niet echt menen, als ze denken dat hun vrienden hen dan meer respecteren.

**MAAR**

Andere mensen zouden geen dingen zeggen die ze niet echt menen, alleen maar om meer respect te krijgen van hun vrienden.

De eerste stelling is helemaal waar voor mij  
De eerste stelling is een beetje waar voor mij  
De tweede stelling is helemaal waar voor mij  
De tweede stelling is een beetje waar voor mij

Sommige mensen denken dat het beter is om zichzelf te zijn, ook al zullen andere mensen boos worden omdat ze zich niet aanpassen aan de groep.

**MAAR**

Andere mensen denken dat het beter is om zich aan te passen aan de groep, zodat er niemand boos op ze wordt.

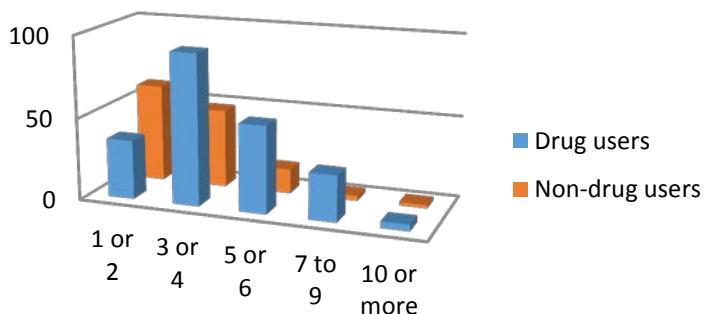
De eerste stelling is helemaal waar voor mij  
De eerste stelling is een beetje waar voor mij  
De tweede stelling is helemaal waar voor mij  
De tweede stelling is een beetje waar voor mij

Dit is het einde van de vragenlijst. Heel erg bedankt voor het invullen!

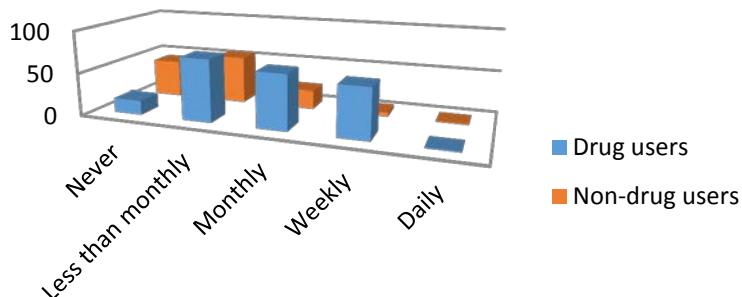
Indien je kans wilt maken op een van de 5 waardebonnen van bol.com t.w.v. €20 kun je hier je emailadres invullen:

## Tables and figures

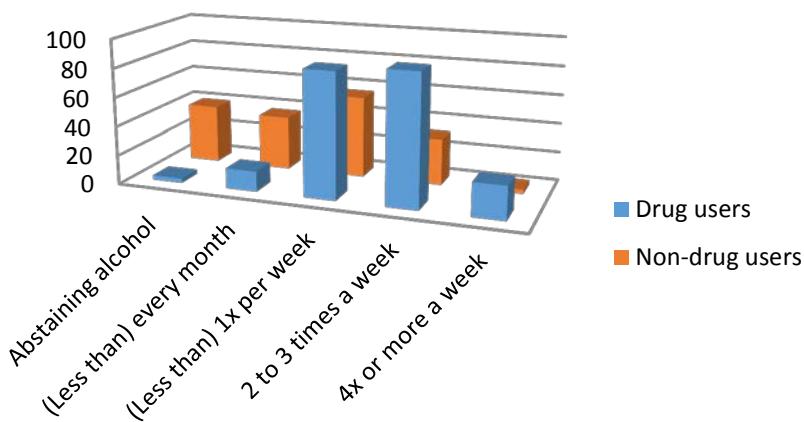
### Average number of standard drinks containing alcohol consumed on a typical day



### Frequency of drinking 6 or more alcoholic beverages on one occasion



### Frequency of drinking alcohol



Alcohol use with drugs:

	<b>Cannabis</b>	<b>XTC/MDMA</b>	<b>Cocaine</b>	<b>Speed</b>	<b>4fmp</b>	<b>Ketamine</b>	<b>Poppers</b>	<b>2CB</b>	<b>Truffles</b>	<b>GHB</b>	<b>LSD</b>
<b>N</b>	103	70	46	36	36	18	16	8	4	4	3
<b>% of all users</b>	51,5%	51,1%	68,7%	61,0%	48,0%	42,9%	48,5%	26,7%	9,3%	19,0%	21,4%
<b>Mean</b>	4,23	3,60	7,39	6,06	3,86	4,78	5,13	5,0	5,75	3,50	3,33