Illicit substance use among university students from seven European countries: A comparison of personal and perceived peer use and attitudes towards illicit substance use

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Abstract:

Objective: To compare European students' personal use and approval of illicit substance use with their perceptions of peer behaviours and attitudes, and investigate whether perceptions of peer norms are associated with personal use of illicit substances and attitudes.

Method: This study used baseline data from the Social Norms Intervention for the prevention of Polydrug usE (SNIPE) project involving 4,482 students from seven European countries in 2012. Students completed an online survey which included questions on personal and perceived peer illicit substance use and personal and perceived peer attitude towards illicit substances.

Results: 51.4% of students perceived that the majority of their peers have used illicit substances at least once in their life. The perception that the majority of peers have used illicit substances at least once was significantly associated with higher odds for personal illicit substance use (OR: 1.97, CI: 1.53-2.54). The perception that the majority of peers approve illicit substance use was significantly associated with higher odds for personal approval of illicit substance use (OR: 3.47, CI: 2.73-4.41).

Conclusion: This study provides support to the view European students misperceive the use and approval of illicit substances. We found an association between the perceived peer norms and reported individual behaviour.

Highlights

- Illicit substance use is prevalent among European university students varying between countries.
- Students had considerable misperceptions of the approval and use of illicit substances by their peers.
- Misperceived norms are associated with a higher likelihood of personal illicit substance use.
- Correcting perceptions of the use of illicit substances of peers could be a worthwhile method for public health campaigns to reduce substance use.

Introduction:

Illicit substance use is particularly prevalent among young adults in Europe. Cannabis remains the most frequently consumed illicit substance but substances such as cocaine, ecstasy and amphetamines are also widely used by young adults (EMCDDA 2010). While cannabis use among young adults has decreased in the last decade, the use of other illicit substances such as amphetamines has remained stable (EMCDDA 2006; EMCDDA 2010). There is virtually no cross-national data on illicit substance use of students but comparable studies indicate that adolescents in England and Spain use illicit substances more frequently compared to young people in in other European countries (EMCDDA 2006; EMCDDA 2013).

Research originating in the USA has identified that peers are the most salient social referents for young population groups, such as University students, and that incorrect perceptions of peers' substance use may exert considerable influence on personal substance use behaviours (Perkins & Wechsler 1996; Perkins 2002). In this context, peer norms can be differentiated into two types: *descriptive and injunctive norms*. The former refers to perceptions of the quantity and frequency of peer substance use and the latter to perceptions of peer approval of substance use. Most evidence on inaccurate perceptions regarding health behaviour in student populations is related to alcohol; numerous studies have shown that students tend to overestimate the alcohol use of their peers (Perkins & Wechsler 1996; Berkowitz 2004; Perkins, Haines & Rice 2005; Page *et al.* 2008) and that perceived norms of peer alcohol use predict how often and how heavily an individual drinks alcohol (Perkins & Wechsler 1996; Lintonen & Konu 2004; Perkins 2007). In addition, there is evidence that students overestimate their peers' use of marijuana (Perkins *et al.* 1999; Wolfson 2000; Kilmer *et al.* 2006), and that peer norms are determinants of marijuana use among students and adolescents (Kilmer *et al.* 2006; Ali, Amialchuk & Dwyer 2011; Arbour-Nicitopoulos *et al.* 2010). Research examining misperceptions of use of other illicit substances is sparse. In a study by Perkins and colleagues (1999), the majority of participants thought that the average student used cocaine, amphetamines or hallucinogens, yet abstinence was the median response for all illicit substances (Perkins *et al.* 1999). These findings were confirmed in a subsequent study by Martens (Martens *et al.* 2006).

Research on alcohol consumption has also shown that students tend to misperceive the *injunctive norms (Borsari & Carey 2003; McAlaney, Bewick & Hughes 2011).* There is meta-analytic evidence of a large discrepancy between students' own alcohol use, the attitudes and the perceived approval from other students, with students perceiving their peers to be more accepting of alcohol use than they actually are *(Borsari & Carey 2003)*. To date, injunctive norms relating to illicit substances have only been examined for marijuana use, with studies indicating that an perceived approval of substance use among close peers is positively associated with personal substance use (Neighbors, Geisner & Lee 2008; Neighbors *et al.* 2008; Buckner 2013).These research findings have given rise to a new form of intervention for reducing substance use known as the "social norms approach", which challenges misperceptions of peer descriptive and injunctive norms via social marketing or personalized web-based feedback to reduce misperceptions and the perceived social pressure on the individual to use these substances *(McAlaney, Bewick & Hughes 2011).*

The vast majority of research into normative misperceptions originates in the USA. A limited number of European studies have evaluated misperceptions of illicit substance use but none have investigated injunctive norms (Ali, Amialchuk & Dwyer 2011; *McAlaney, Bewick & Hughes 2011)*. In the present study, we assessed personal use as well as the approval of illicit substance use, and evaluated perceptions of peers' use and peers approval of illicit substances among students from seven European countries. The following hypotheses guided the research: (a) European University students perceive that the use and approval of illicit substances by the majority of their peers is higher than the estimates based on actual reported own consumption, (b) students showing high perceptions of the consumption or approval of illicit substance use of their peers will be more likely to use illicit substances or approve illicit substance use on their own.

Methods:

Data:

The analysis is based on data from the Social Norms for the prevention of Polydrug usE (SNIPE) project funded by the European Commission (LS/2009-2010/DPIP/AG). An overview of the SNIPE trial is provided elsewhere (Pischke *et al.* 2012). SNIPE involved the development of a personalised feedback website for substance use for students from universities in Belgium, Denmark, Germany, the Slovak Republic, Spain, Turkey and the United Kingdom. The number of participating universities varied across countries with two universities in Belgium, Denmark, Spain and the UK, three in Germany, four in the Slovak Republic and six in Turkey. The project involved the collection of baseline survey data from students to develop a web-based personalised social norms feedback intervention. Participants were recruited by various means, including emails, class announcements, adverts on virtual learning environments and printed flyers. Students first registered on the SNIPE website and were simultaneously informed that their information was pseudonymised during the survey and anonymised for statistical analysis. Subsequently, a hyperlink to the survey webpage were emailed.

This survey included questions on the student's personal use of licit (alcohol, tobacco) and illicit substances (see 'measurements'), their attitudes towards the use of these substances and their perceptions of their peers' substance use behaviours and attitudes. Demographic data, including participant's age, gender, migrant status, year of study and living situation (with other students or not) were also collected. Study participation was voluntary. Research ethical approval was obtained from each site involved in the SNIPE project.

Measurements:

To measure personal illicit substance use, students were asked how often they used a variety of illicit substances, including: cocaine, ecstasy, other amphetamine-type stimulants, hallucinogens, synthetic cannabinoids, and inhalants, followed by a list of examples and street names for each substance. In our study we also examined the use of cannabis but did not include cannabis in these analyses as the prevalence is considerably higher than that of other illicit substances (EMCDDA 2013). The choice of illicit substances was based on the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST), developed by the World Health Organization (Humeniuk *et al.* 2010). Response options

ranged from 'Never in my life', 'Have used but not in the last two months' to 'Every day or nearly every day'. If students indicated usage of at least one of the stated substances at some time in their life they were coded as *lifetime illicit substance users*. Participants who reported having used at least one of the illicit substances in the previous two months at least once were categorized as *current illicit substance users.*

Perceptions of rates of peer illicit substance use were assessed using sex-specific items based on the corresponding personal use categories. The respondents were asked "How often in the last two months do you think most (at least 51%) of the [same sex] students at your university have used the following?". Moreover, we collected data on personal and perceived peer attitudes towards illicit substances using the questions "Which of the following best describes your attitude to using each of these substances?" and "Which of the following do you think best describes the attitude of most (at least 51%) of the [same sex] students at your university to the use of each of these substances?". Response options were 'Never ok to use', 'Ok to use occasionally if it doesn't interfere with study or work', 'Ok to use frequently if it doesn't interfere with study or work', 'Ok to use occasionally even if it does interfere with study or work', 'Ok to use frequently if that is what the person wants to do'.

Statistical analysis:

Descriptive analysis was performed using tabulations for personal substance and attitudes towards illicit substances by sex and by country. We calculated 95% bootstrap confidence intervals based on 1000 bootstrap samples for each country. Furthermore, we generated the percentages of respondents who perceived the alcohol use of a typical student as higher/as identical/as lower as the report of the corresponding own behavior estimate. Binary logistic regression analyses were subsequently conducted to examine associations between perceived and personal behaviours and attitudes. Sex, age, year of study, living situation and perceived substance use/attitude towards substance use were included as independent variables in the models. For these analyses age was used as a continuous variable and all others as categorical variables. To investigate whether sex or country moderates the association between perception and personal behaviour/attitude, we added the two relevant interaction terms to the regression models. For the main descriptive norms model we used lifetime illicit substance use as the dependent variable but also repeated the same analysis with the dependent variable current illicit substance use. Additionally, we conducted stratified analyses by variables for those interactions which were significant at the $p<0.05$ level. Data analysis was performed using SPSS for windows, version 20.0.

Results:

The self-administered web-based questionnaire was completed by 4,482 university students in 2012 (71.4% female). A minority of participants (5.2%) were foreign born. More than 50% of the participants were from the Slovak Republic (43.2%, n=1,938) and Turkey (19.1%, n=858) with Spain (4.1%, n=185) and the UK (2.4%, n=107) contributing the lowest numbers of participants (Table 1).

Current illicit substance use rates in the participating countries varied from 0.5% of males and 0.7% of females in the Slovak Republic to 19.4% of males in the UK and 6.2 % of females in Germany In

terms of lifetime use, students from Turkey showed the lowest illicit substance use rates (6.5% for males/2.7% for females) and German students the highest rates (33.8%/18.2%). The majority of students (80.4%) across all countries disapproved of illicit substance use (Table 2)..

We found that almost half of the students (49.7%) perceived their peers to show are more frequent illicit substance use than themselves. Moreover, students perceived their peers to be more approving of illicit substance use than themselves (Table 3).

The perception that the majority of students have ever used illicit substances was associated with a higher likelihood for personal lifetime illicit substance use (OR: 1.97, CI: 1.53-2.54). Additionally, male (OR: 1.97, CI: 1.55-2.52) and older students (OR: 1.03, CI: 1.01-1.05) were more likely to report lifetime illicit substance use (Table 4). Perceived peer approval of illicit substance use (OR: 3.47, CI: 2.73-4.41) was associated with own approval of illicit substance use. Being a male student (OR: 1.93, CI: 1.52-2.46) and ever having used illicit substances personally (OR: 17.02, 12.79-22.64) was associated with a higher likelihood of personal approval regarding illicit substances (Table 5).

Interaction terms in both models showed that the effect of perception on the outcome variable was modified by country but not by sex. A stratified analysis of descriptive norms by country showed a relatively strong association between the perception of other students' behaviour and own behaviour remained significant in Turkey and the Slovak Republic but not in the other countries. There was no association in Denmark, Germany and the UK. In Spain, where the sample was particularly small, there was a complete separation of data and no country specific estimate was able to be generated. In terms of injunctive norms, perceived approval of peers regarding illicit substance use remained associated with own approval of illicit substance use after stratification in all countries except Spain and the UK, where both estimates were close to 1.

Discussion:

The findings of our study indicated that high percentages of students thought that their peers have used illicit substances more often than themselves and that peers are more approving towards illicit substance use than themselves. This is consistent with previous US (Martens *et al.* 2006; Perkins 2007) and European studies (Boot *et al.* 2012). In addition, our findings offer a first look at discrepancies between personal and other peer illicit substance use of injunctive norms: 29% of the participating students thought that their peers are more approving towards illicit substances than themselves. These misperceptions of injunctive norms are comparable to those found in alcohol research (Larimer *et al.* 1997; Borsari & Carey 2003).

Across all participating countries perceived descriptive norms were associated with personal substance use. Perceived injunctive norms were consistently associated with personal attitude towards illicit substances. After stratification by country a significant association between the perceptions that the majority have used illicit drugs during their life and personal use remained only in the Slovak Republic and Turkey; the two countries with the highest numbers of participants. We found no association in the other participating countries. In this regard our results vary from findings obtained in alcohol research in the US which showed strong associations between perceptions of descriptive norms and personal alcohol use (Perkins, Haines & Rice 2005). This difference may be due to the European setting involving different attitudes and legal restrictions or may be explained by differences in norms of perception of illicit drug use and of alcohol use. Research on marijuana use showed that personal use was strongly associated with the perception of friends' use but not with perceived use of students in general (Kilmer *et al.* 2006). We would speculate that the proximity of the reference group is more important in the field of illicit substances compared to licit substances. Furthermore, the Slovak Republic and Turkey illicit substance use rate was comparatively low, and the gap between actual consumption rate and the perception was larger compared to other countries. We found an association between personal attitude towards illicit substance use and perceived attitude of peers in all countries except Spain and UK. Samples in both countries were comparatively small and this may explain the lack of statistical significance for this association. Larger samples are needed to confirm this finding with a higher precision.

The persistence of perceived descriptive and injunctive norms of peers as significant predictors of own illicit substance use and approval of illicit substance use when adjusting for other factors indicates the important influence of norms on personal behaviours. These findings are consistent with prior research indicating an association between inflated perceived norms and own consumption (Perkins *et al.* 1999; Martens *et al.* 2006). Previous studies suffered from limitations, which the current study was able to account for: Perkins et al. reported aggregate data on campus level that did not allow conclusions about associations between individual perceptions and behaviours (Perkins *et al.* 1999). Martens et al. found associations on the individual level among undergraduate students, but did not control for moderator variables such as age and sex (Martens *et al.* 2006). Our study provides more extensive information about illicit drug use among European students and the impact of injunctive norms in the area of illicit substance use.

From a public health perspective, further research into the influence of injunctive norms on illicit substance use appears of high importance given that research on alcohol use indicates that injunctive norms perceptions are malleable and inducement of perceptions do not require extensive interventions (Prince & *Carey* 2010).

Limitations:

Our study has some limitations which need to be considered. Due to its reliance on self-reported data, our study is subject to under- or over-reporting bias. To mitigate this potential our data was collected via a confidential online survey which is accepted as a reliable means of collecting high quality substance use data in computer literate populations such as students (Kypri, Gallagher & Cashell-Smith 2004). The study design did not include sophisticated recruitment strategies to ensure representative participation numbers. Therefore the observed substance use prevalences may not be representative for university students in the participating countries. Similarly, regional substance use variations could not be accounted for because the collected information was restricted to selected university locations in the respective country. Variation in substance use rates across sites may reflect differences in the constituencies based on the types of universities involved. Selection bias may have resulted in a sample with higher or lower substance use and attitudes different to the wider student population. Although substance use rates varied between European countries (UNODC 2013), it is possible that students with particularly high drug use patterns participated in Germany and the UK, samples with the highest illicit substance use rates. Based on the data collection procedure students may have not reported their illicit drug use accurately because they may have perceived that they could be identified even if the researchers assure them that their identities would not be disclosed. Additionally, our cross-sectional analysis does not allow for causal inferences regarding the association between perceptions and personal use.

Conclusion:

Our findings provide an essential contribution to the existing illicit substance use literature across European countries. Our study extends social norms research by examining the influence of injunctive norms on illicit substance use. Perceived descriptive as well as injunctive peer norms were associated with reported individual behaviour. These findings are particularly relevant for health promotion and indicate potential benefits of social normative feedback for substance use in university students.

Conflict of interest:

None of the authors have any financial or other interests that might influence the conduct of the study or accurate reporting of the results.

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References

Ali, M.M., Amialchuk, A. & Dwyer, D.S., 2011, 'The social contagion effect of marijuana use among adolescents', *PloS one* 6(1), e16183.

Arbour-Nicitopoulos, K.P., Kwan, M.Y.W., Lowe, D., Taman, S. & Faulkner, G.E.J., 2010, 'Social Norms of Alcohol, Smoking, and Marijuana Use within a Canadian University setting', *Journal of American College Health*, 59:3, 191-196

Berkowitz, A.D., 2004, 'The Social Norms Approach: Theory, Research, and Annotated Bibliography' 2004.

Boot, C.R., Dahlin, M., Lintonen, T., Stock, C., van Hal, G., Rasmussen, S. & McAlaney, J., 2012, 'A survey study on the associations between misperceptions on substance use by peers and health and academic outcomes in university students in North-West Europe', *International Journal on Disability and Human Development* 11(3), 273–279.

Borsari, B. & Carey, K.B., 2003, 'Descriptive and injunctive norms in college drinking: a meta-analytic integration', *Journal of studies on alcohol* 64(3), 331–341.

Buckner, J.D., 2013, 'College cannabis use: the unique roles of social norms, motives, and expectancies', *Journal of studies on alcohol and drugs* 74(5), 720–726.

European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), 2006, '*Annual Report 2006: Selected Issues: A gender perspective on drug use and responding to drug problems'*, Luxembourg, Publications Office of the European Union.

European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), 2010, 'The state of the drugs problem in Europe. Annual report 2010`, Luxembourg, Publications Office of the European Union.

European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), 2013, 'European Drug Report. Trends and development 2013', Luxembourg, Publications Office of the European Union.

Humeniuk, R.E., Henry-Edwards, S., Ali, R.L., Poznyak, V. & Monteiro, M., 2010,'The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): manual for use in primary care', Geneva, World Health Organisation.

Kilmer, J.R., Walker, D.D., Lee, C.M., Palmer, R.S., Mallett, K.A., Fabiano, P. & Larimer, M.E., 2006, 'Misperceptions of college student marijuana use: implications for prevention', *Journal of studies on alcohol* 67(2), 277–281.

Kypri, K., Gallagher, S.J. & Cashell-Smith, M.L., 2004, 'An internet-based survey method for college student drinking research', *Drug and alcohol dependence* 76(1), 45–53.

Larimer,M.E., Irvine, D., Kilmer, J.R & Marlatt, K.A., 1997, 'College drinking and the Greek system: Examining the role of perceived norms for high risk behaviour.', *Journal of College Student Development*(38), 587–598.

Lintonen, T.P. & Konu, A.I., 2004, 'The misperceived social norm of drunkenness among early adolescents in Finland', *Health education research* 19(1), 64–70.

Martens, M.P., Page, J.C., Mowry, E.S., Damann, K.M., Taylor, K.K. & Cimini, M.D., 2006, 'Differences between actual and perceived student norms: an examination of alcohol use, drug use, and sexual behavior', *Journal of American college health: J of ACH* 54(5), 295–300.

McAlaney, J., Bewick, B.M. & Hughes, C., 2011, 'The international development of the 'Social Norms' approach to drug education and prevention.', *Drugs: Education Prevention and Policy*(18), 81–89.
Neighbors, C., Geisner, I.M. & Lee, C.M., 2008, 'Perceived marijuana norms and social expectancies among entering college student marijuana users', *Psychology of addictive behaviors: journal of the Society of Psychologists in Addictive Behaviors* 22(3), 433–438.
Neighbors, C., O'Connor, R.M., Lewis, M.A., Chawla, N., Lee, C.M. & Fossos, N., 2008, 'The relative impact of injunctive norms on college student drinking: the role of reference group', *Psychology of addictive behaviors : journal of the Society of Psychologists in Addictive Behaviors* 22(4), 576–581.
Page, R.M., Ihasz, F., Hantiu, I., Simonek, J. & Klarova, R., 2008, 'Social normative perceptions of alcohol use and episodic heavy drinking among Central and Eastern European adolescents', *Substance use & misuse* 43(3-4), 361–373.
Perkins, H.W., 2002, 'Surveying the damage: a review of research on consequences of alcohol misuse in college populations', *Journal of studies on alcohol. Supplement* 14(14), 91–100.
Perkins, H.W., 2007, 'Misperceptions of peer drinking norms in Canada: another look at the "reign of error" and its consequences among college students', *Addictive Behaviors* 32(11), 2645–2656.
Perkins, H.W. & Wechsler, H., 1996, 'Variation in Perceived College Drinking Norms and Its Impact on Alcohol Abuse: A Nationwide Study', *Journal of Drug Issues* 26, 961–974.
Perkins, H.W., Meilman, P.W., Leichliter, J.S., Cashin, J.R. & Presley, C.A., 1999, 'Misperceptions of the norms for the frequency of alcohol and other drug use on college campuses', *Journal of American college health: J of ACH* 47(6), 253–258.
Perkins, H.W., Haines, M.P., & Rice, R., 2005, 'Misperceiving the college drinking norm and related problems: A nationwide study of exposure to prevention, information, perceived norms and student alcohol misuse', *Journal of Studies on Alcohol* 66, 470-478.
Pischke, C.R., Zeeb, H., van Hal, G., Vriesacker, B., McAlaney, J., Bewick, B.M., Akvardar, Y., Guillen-Grima, F., Orosova, O., Salonna, F., Kalina, O., Stock, C., Helmer, S.M. & Mikolajczyk, R.T., 2012, 'A feasibility trial to examine the social norms approach for the prevention and reduction of licit and illicit drug use in European University and college students', *BMC public health* 12, 882–2458-12-882.
Prince, M.A., Carey, K.B., 2010, 'The Malleability of Injunctive Norms Among College Students', *Addictive Behaviors* 35(11), 940-947.
UN Office on Drugs and Crime (UNODC), 2013,'*World Drug Report 2013',* E.13.XI.6(E.13.XI.6).
Wolfson, S., 2000, 'Students' estimates of the prevalence of drug use: evidence for a false consensus effect', *Psychology of addictive behaviors: journal of the Society of Psychologists in Addictive Behaviors* 14(3), 295–298.

Table 1. Sample characteristics (n indicates number of participants who have given information on gender)

	Belgium (n = 424)	Denmark (n = 461)	Germany (n=503)	Slovak Republic (n =1931)	Spain (n=184)	Turkey (n=855)	United Kingdom (n=107)
Sex(%)							
Female	79.2	78.1	58.8	79.5	71.7	53.1	69.2
Male	20.8	21.9	41.2	20.5	28.3	46.9	30.8
Age Categories (%)							
<20	53.1	11.9	11.1	30.5	38.6	40.7	39.3
21-25	38.7	60.1	57.1	66.7	41.8	54.0	29.9
26-30	4.5	17.1	23.5	2.3	9.2	3.9	12.1
31+ years	3.8	10.8	8.3	0.5	10.3	1.4	18.7
Foreign Student (%)*	7.5	11.7	7.0	1.1	9.2	4.2	33.6
Residence (% living with other students)	21.6	12.1	35.8	51.5	22.3	26.2	50.5
Religion (%)							
Christian	58.6	55.7	48.3	81.4	53.3	0.5	30.2
Muslim	3.1	1.7	1.6	0.1	0.5	85.1	24.5
Jewish	0.7	0.0	0.2	0.1	0.0	0.4	0.0
Hindu	0.0	0.2	0.0	0.1	0.5	0.0	0.9
Buddhist	1.6	0.9	2.2	0.7	0.5	0.1	2.8
Other	3.1	6.0	4.2	2.7	3.3	4.4	9.4
No religious beliefs	32.9	35.4	43.5	15.0	41.8	9.6	32.1

** measured by the question about country of birth.*

Table 2: Personal illicit substance use and approval of illicit substance use by country and sex (95% bootstrap CI)

		Belgium		Denmark		Germany		Slovak Republic		Spain		Turkey		UK	
		Male	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*
Illicit substance use (%)	*Used i*n the last two months	7.1 (2.3-13.7)	1.6 (0.3-3.1)	2.0 (0.0-5.4)	0.3 (0.0-0.9)	11.3 (7.2-16.1)	6.2 (3.4-9.2)	0.5 (0.0-1.4)	0.7(0.3-1-1)	6.4 (0.0-14.3)	0.8 (0.0-2.5)	2.1 (0.8-3.6)	0.7 (0.0-1.6)	19.4 (6.5-34.6)	3.0 (0.0-7.8)
	Used once in their life	13.1 (6.3-21.3)	5.4 (2.9-8.0)	17.0 (10.2-25.3)	8.0 (5.2-11.2)	33.8 (27.7-40.4)	18.2 (14.3-23.1)	6.8 (4.5-9.5)	4.6 (3.5-5.8)	8.5 (1.9-17.4)	4.7 (1.5-8.5)	6.5 (4.1-9.0)	2.7 (1.2-4.3)	32.3 (16.7-48.4)	16.7 (8.1-26.5)
Approval of illicit substance use (%)	Never ok to use	72.9 (62.8-82.8)	83.9 (79.4-87.8)	78.3 (69.2-86.5)	90.0 (86.9-93.0)	54.8 (47.4-62.0)	76.6 (71.5-81.4)	86.4 (82.8-89.8)	94.5 (93.3-95.6)	80.4 (68.0-91.7)	92.9 (87.8-97.3)	90.7 (87.5-93.7)	93.1 (90.7-95.5)	57.1 (38.7-75.0)	67.2 (55.2-78.1)
	Ok to use if it doesn't interfere with work or study*	25.9 (16.2-35.9)	14.8 (10.9-19.0)	16.3 (9.2-24.5)	8.8 (5.9-12-1)	41.5 (34.4-48.7)	19.7 (15.3-24.8)	13.1 (9.6-16.6)	5.3 (4.3-6.5)	15.2 (5.7-26.5)	6.2 (1.8-10.9)	7.5 (4.8-10.4)	5.6 (3.3-8.0)	35.7 (17.9-53.8)	31.3 (20.3-43.3)
	Ok to use**	1.2 (0.0-4.1)	1.3 (0.3-2.7)	5.4 (1.1-10.6)	1.2 (0.3-2.5)	3.7 (1.1-6-6)	3.6 (1.5-6-2)	0.5 (0.0-1.4)	0.1 (0.0-0.4)	4.3 (0.0-11.1)	0.9 (0.0-2.8)	1.8 (0.6-3.3)	1.3 (0.3-2.5)	7.1 (0.0-18.5)	1.5 (0.0-4.8)

* 'Ok to use occasionally if it doesn't interfere with study or work', 'Ok to use frequently if it doesn't interfere with study or work' were collapsed into Ok to use if it doesn't interfere with work or study

**'Ok to use occasionally even if it does interfere with study or work', 'Ok to use frequently if that is what the person wants to do' were collapsed into Ok to use

Table 3: Differences between personal illicit substance use/approval of illicit substance use and the perceived illicit substance use/approval of illicit substance use of the majority of peers of the same sex and same university

	Lifetime illicit substance use (%)	*Approval of illicit substance use (%)*
Majority of their same-sex peers < own	*3.2*	*4.6*
Majority of their same-sex peers = own	*47.1*	*66.2*
Majority of their same-sex peers > own	*49.7*	*29.2*

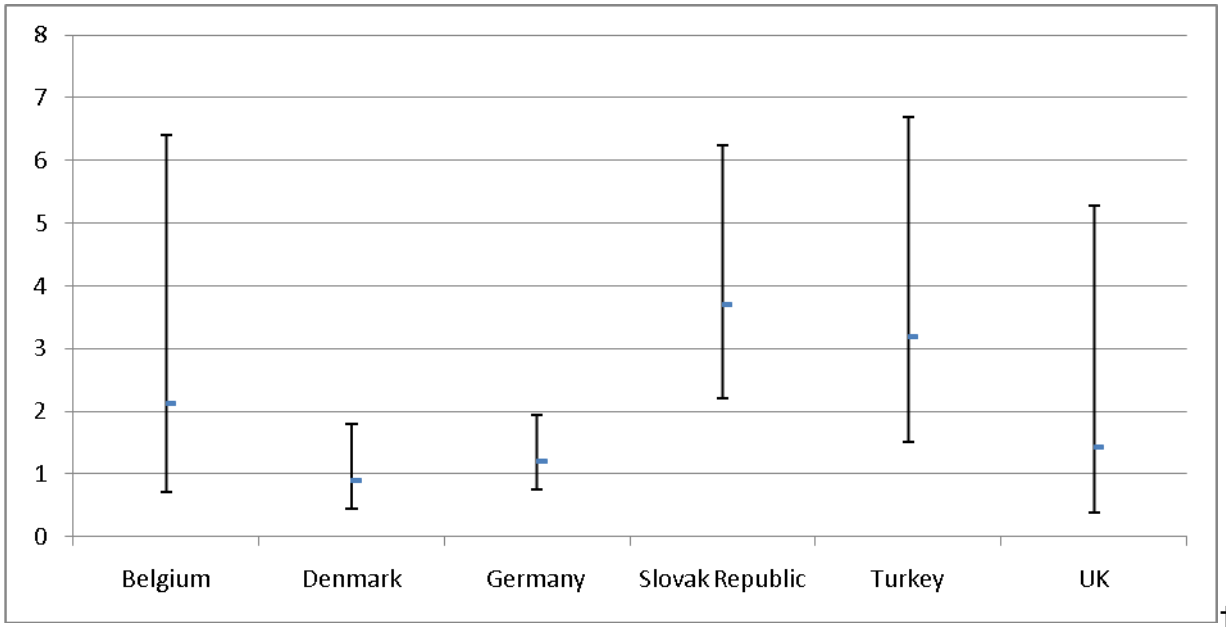
Table 4: Associations between personal lifetime illicit substance use /personal attitude towards illicit substance use and perceived and perceived lifetime illicit substance use of peers/ attitude of peers, personal illicit substance use, country, age, sex as well as living situation– Results of a binary log. regression.

Variables		Ever used illicit substances	Positive attitude towards illicit substance use (okay to use and okay to use if it does not interfere with study or work)
	Proportion (%)	OR (95% CI)	OR (95% CI)
Perceived peer behaviour (Lifetime illicit substance use)	51.4	1.97 (1.53-2.54)	
Perceived peer behaviour (Not used	48.6	1.00	

illicit substances)			
Perceived peer attitude to illicit substance use (Never okay to use)	62.7		1.00
Perceived peer attitude to illicit substance use (okay to use)	37.3		3.47 (2.73-4.41)
Never used illicit substances	91.3		1.00
Ever used illicit substances	8.7		17.02 (12.79-22.64)
Country			
Slovak Republic	43.5	1.00	1.00
Belgium	9.3	1.19 (0.75-1.90)	2.70 (1.85-3.93)
Denmark	10.4	1.47 (0.94-2.30)	2.35 (1.50-3.68)
Germany	11.6	3.84 (2.76-5.36)	3.41 (2.42-4.81)
Spain	4.2	0.90 (0.45-1.81)	1.56 (0.84-2.90)
Turkey	18.9	0.72 (0.47-1.10)	1.27 (0.86-1.87)
United Kingdom	2.2	3.92 (2.23-6.88)	3.84 (2.09-7.05)
Age		1.03 (1.01-1.05)	0.97 (0.94-1.00)
Gender			
Female	71.6	1.00	1.00
Male	28.4	1.97 (1.55-2.52)	1.93 (1.52-2.46)
Living situation			
With other students	35.7	1.00	1.00
Alone or with partner	23.7	1.37 (1.00-1.89)	0.76 (0.55-1.06)
With parents	37.2	0.85 (0.62-1.16)	0.74 (0.56-0.99)
Other	3.4	1.00 (0.53-1.86)	0.67 (0.34-1.31)

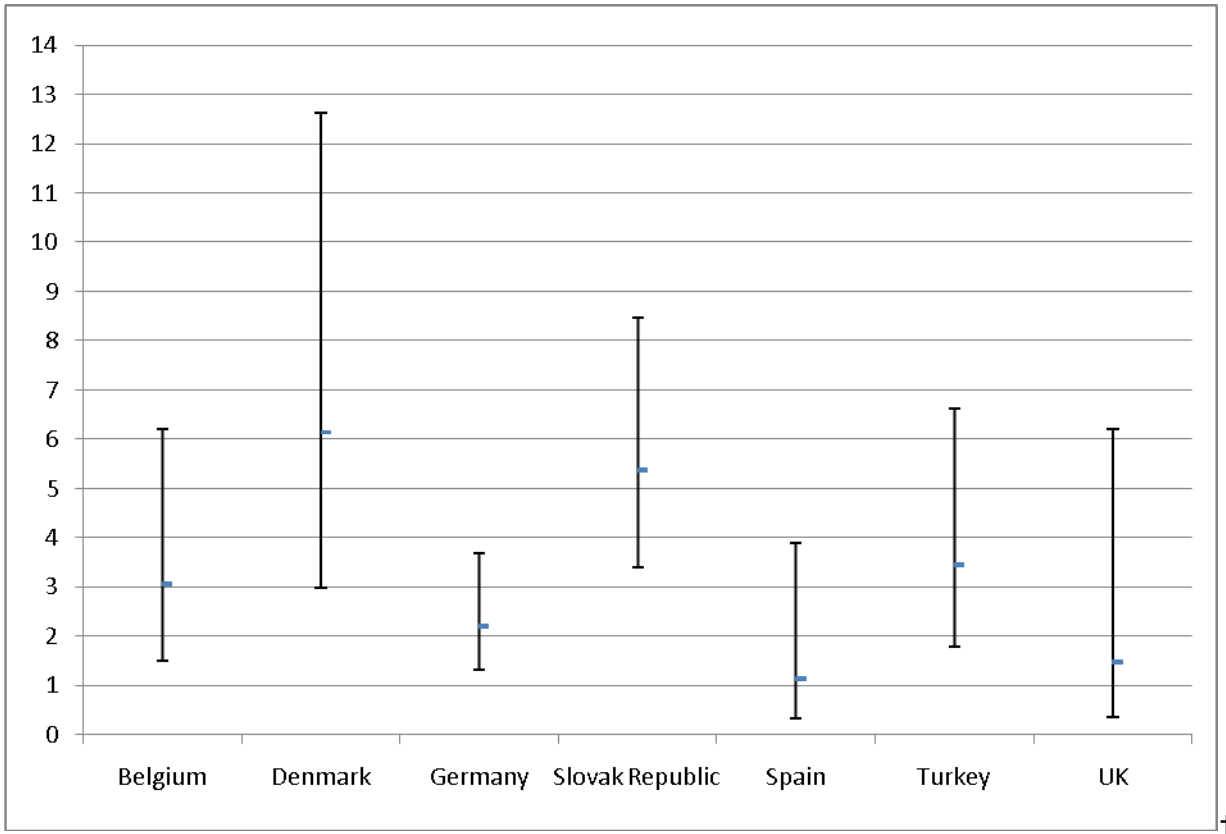
†All variables in the table were included in the logistic regression analysis and are therefore controlled for. Year of study was included as a categorical variable in the model but was not found to be a significant predictor and is not shown in the table.

Figure 1: Associations between personal lifetime illicit substance use and perceived substance use of peers stratified by country (OR and 95% CI)



†Adjusted for gender, age, year of study and living situation, due to a small sample in Spain no country specific estimate for Spain was generated.

Figure 2: Associations between personal attitude towards illicit substance and perceived attitude of peers stratified by country (OR and 95% CI)



†Adjusted for personal substance, gender, age, year of study and living situation