

Influence of cannabis use trajectories, grade repetition and family background on the school-dropout rate at the age of 17 years in France

Stéphane Legleye^{1,2}, Ivana Obradovic¹, Eric Janssen¹, Stanislas Spilka¹, Olivier Le Nézet¹, François Beck^{3,4}

Background: Research has shown that cannabis use contributes to school dropout, but few studies have distinguished the age at onset of use from the age at progression to daily use neither their interaction with grade repetition. **Methods:** This study is based on a French representative cross-sectional survey ($N=29\,393$ teenagers aged 17 years) and uses retrospective data. The influence of drug-use patterns <16 years of age on school-dropout rates (5.3%) are modelled with logistic regressions among boys and girls. **Results:** The main factors associated with dropout were a low family socio-economic status, early grade repetition, single-parent families and daily tobacco smoking ($ORa \geq 2.6$). The link with the move to daily cannabis use was more evident when it occurred <14 years of age ($ORa=2.05$ for boys and 3.41 for girls) rather than at ≥ 15 years ($ORa=1.45$ for both sexes). The onset of cannabis use was not significant when occurring <14 years of age, but was linked to school attainment when occurring at age 15–16 years ($ORa=0.80$ for boys and 0.64 for girls). Results are similar for alcohol use. Repeating a grade before beginning to use cannabis increased the dropout rates compared with the opposite sequence. Girls were more affected by early grade repetition and by early and daily cannabis use. **Conclusion:** Cannabis use is rarely a trigger for grade repetition but can have either damaging or positive effects on school attainment depending of the level of use. Positive social competence reflected by peer initiation should be investigated to understand this paradoxical effect.

Keywords: cannabis, drug use, France, gender, school dropout.

Introduction

School dropout is an important issue in many countries.^{1,2} The increase of drug use in most countries, especially among students,^{3,4} recently raised concerns about its relationship with the dropout problem. In 2007, Townsend⁵ included 46 studies on this topic in his literature review, 21 showing that alcohol use,⁶ tobacco use and cannabis use^{7,8} were contributing factors to high school dropout, even though the reverse was also observed. Research also underlined associations between school-dropout rates and parental cohabitation,⁹ socio-economic backgrounds^{10–12} and early onset drug use. The latter affects individual learning abilities¹³ and is associated with grade repetition.¹⁴ These studies adopted different theoretical stances (testing the influence of peers, general deviance, etc.), methodologies (cross-sectional and longitudinal), samples (general population, dropout samples, local or national samples) and even definitions for the term ‘dropout’ (ranging from 30 days of absence to total disenrollment, graduated or not).

Less emphasis has been placed on certain aspects. Firstly, in some educational systems, grade repetition may be an option

if pupils have low marks. The earlier it occurs, the more it reflects a lack of basic academic competence, and the stronger the effect on the school-dropout risk is expected to be.¹⁵ It has been proven that it is correlated to the onset of cannabis use and cannabis use in general,^{16,17} but their interaction has rarely been studied: cannabis use can precede¹⁴ or follow¹⁶ grade repetition, with varied effects on dropout rates. Secondly, cannabis experimentation does not systematically lead to a regular use: taking the whole cannabis use ‘trajectory’ (or ‘career’, to paraphrase Howard Becker¹⁸) into account is thus necessary in order to provide an unbiased evaluation of the effect of use and age at onset on school-dropout rates. Studying early onset cannabis use can lead to error, especially concerning early school failure.¹⁹ Only a few longitudinal studies can claim to provide evaluations on this point. Thirdly, despite Guxens’s study²⁰ on gender-specific factors associated with the onset of cannabis use, and the research conducted by Van Ours,²¹ which showed a more marked impact of cannabis use on the school-leaving age among girls, very few studies have focused on gender-specific differences on this topic. Finally, almost all studies on drug use and school dropout have been based on surveys conducted in the USA, New Zealand or Australia. Apart from a study carried out in Norway (which only dealt with alcohol use⁶), none was carried out in Europe, where the levels of cannabis use³ and the cultural and educational contexts are different.¹

The present study explored, for the first time, the processes leading to school dropout at the end of the compulsory schooling period in France. It should be noted here that France has one of the highest cannabis use rates among adolescents in Europe.³ We considered cannabis use trajectories (age of experimentation and of daily use) and school failure history (age of grade repetition), taking

1 French Monitoring Centre for Drugs and Drug Addiction – Observatoire Français des Drogues et des Toxicomanies (OFDT)

2 Inserm U669, Paris XI University, Paris, France

3 National Institute for Prevention and Health Education (INPES), Saint-Denis, France

4 Cesames, Centre de Recherche Psychotropes, Santé mentale, Société (CNRS UMR 8136, Inserm U611, René Descartes Paris V University, Paris, France)

Correspondence: Stéphane Legleye, OFDT: 3 avenue du stade de France, 93218 Saint-Denis la Plaine, France, tel: +33 1 41 62 77 37, fax: +33 1 41 62 77 00, e-mail: stleg@ofdt.fr

advantage of a national survey at the end of the compulsory schooling period.

Four hypotheses are tested in this article. The first states that cannabis use may trigger the first grade repetition. The second states that any cannabis use would increase school-dropout rates, regardless of the frequency of use or how early use or daily use began. The third studied whether or not the order of events between grade repetition and cannabis use during school years influence school-dropout rates. The fourth studied whether the effect of cannabis use on school dropout is more marked among girls.

Methods

Data collection

The Survey on Health and Consumption during the Day of Defense Preparation (ESCAPAD) is carried out regularly by the French Monitoring Centre for Drugs and Drug Addiction with the National Service Department. Attending this one-day session of civic and military information is required in order to register for all public exams (driving licence, university exams, etc.). Data collection takes place over a week in all the 300 civilian and military centres throughout France. The questionnaire follows the recommendations of the European Monitoring Centre for Drugs and Drug Addiction.²² Participants are guaranteed complete confidentiality and anonymity. In 2005, 32 189 adolescents were surveyed in metropolitan France: 153 refused to participate; 385 questionnaires with missing age or gender, 89 with more than half the variables missing and those filled in by 3527 individuals aged >17 years, were excluded. The final sample comprised 29 393 teenagers aged exactly 17 years living in metropolitan France. The response rate exceeded 98% for the socio-demographic and drug-use questions. The survey has received the public statistics general interest seal from the National Council for Statistical Information (CNIS), as well as the favourable opinion of the French Data Protection Authority (CNIL). A complete description of the methodology used has already been published.²³

Measures

Schooling is compulsory until the age of 16 years. The outcome variable was self-reported 'dropping out' at age 17 years. Family and school-level covariates are: socio-economic status (SES) of the family (determined by the highest occupational category of the parents, according to the national classification of occupations),²⁴ parent's divorce/separation, grade repetition history (none, first year repeated before age 12, at age 13–14 and at age 15–16 years, these ages being calculated based on the first repeated grade and the respondent's current age).

Drug-use covariates were: daily tobacco use (no/yes), lifetime alcohol use (none/yes but without drunkenness/with drunkenness), cannabis use and lifetime use of 'rare drug' (none, one, two and more). Two variables were calculated for cannabis use. The first one focuses on age at the onset of cannabis use (no use, first use <14 years of age without subsequent daily use, first use <14 years of age with subsequent daily use, first use at age 15–16 years without subsequent daily use, first use at age 15–16 years with subsequent daily use); the second one focuses on age at the transition to daily use (no use, lifetime use without subsequent daily use, daily use <14 years of age, daily use before 15–16 years of age). 'Rare drugs' referred to poppers, hallucinogenic mushrooms, ecstasy, amphetamines, cocaine, crack, heroin and LSD.

The age at onset of tobacco use, cannabis use, drunkenness and 'rare drug' use was reported (the earliest amongst the 11 was used). The age of progression to daily use was reported for tobacco and cannabis use. Only usage <16 years of age (inclusive) is taken into account to guarantee its antecedence with relation to dropping out of school. Later uses were recoded into non use.

Data analysis

Dropout rates were analysed with bivariate statistics, and then modelled using multivariate dichotomous logistic regression controlling for all covariates. The first model focuses on age at the onset of cannabis use while the second one focuses on age at the transition to daily use. Analyses were conducted separately by gender. Additionally, interaction tests between gender and all other variables were conducted for each model.

The analysis was carried out using SAS 9.1 software.

Results

Dropout rates according to individual characteristics

Dropping out of school at 17 years of age was more prevalent among boys than girls (5.3% vs. 3.4%, $P < 0.0001$). Results presented in table 1 show that the dropout rate was higher among individuals from disadvantaged socio-economic backgrounds or having divorced/separated parents. Grade repetition, especially early one, was a strong predictor. Associations with daily tobacco use or rare drug use <16 years of age were strong. Compared with lifetime abstinence, experimentation with alcohol was linked to school attainment among boys ($P < 0.001$) and girls ($P < 0.01$), but not experimentation with drunkenness. Compared with lifetime abstinence, experimentation with cannabis <14 years of age, without any subsequent daily use, was linked to school dropout among boys ($P < 0.05$), but not among girls ($P = 0.93$); experimentation at age 15–16 years, without any subsequent daily use, was linked to school attainment among girls ($P = 0.01$), but not boys ($P = 0.38$). However, daily cannabis use <16 years of age was a strong predictor of school dropout, especially when occurring <14 years of age ($P < 0.001$).

Cannabis use and grade repetition

Table 1 shows that for both genders, dropout rates were higher among people who repeated a grade before experimenting with cannabis or before smoking it on a daily basis, compared with those for whom the reverse was true. Additionally, cannabis experimentation preceded or coincided with the first grade repetition for 7.8% of students and 8.2% of dropouts among males (5.4 and 5.7% among females), that is respectively 30.7% of the students and 19.4% of the dropouts reporting both experimentation and grade repetition among males (32.5 and 19.5% among females). A progression to daily cannabis use before grade repetition was reported by 0.9% of the students and 1.8% of the dropouts among males (0.6 and 1.5% among females), i.e. respectively 15.0% of students and 8.4% of dropouts reporting both daily use and grade repetition among males (21.4 and 13.7% among females).

Early onset cannabis use

The leading factors associated with the early onset cannabis use (table 2) were the family's economic background (adjusted odds ratio—ORa >4 for unemployed parents, compared with managerial staff), parental separation

Table 1 School-dropout rates at the age of 17 years according to subject characteristics

	Boys		Girls	
	N	%	N	%
	14 935	5.3	14 458	3.4
Parents				
Living together	10 616	3.6	10 256	2.6
Divorced/separated	4252	9.3	4152	5.3
Parents' employment status				
Farmers	637	3.4	582	1.5
Craftsmen and trade workers	2229	5.7	2087	3.8
Managerial staff	3126	2.3	3077	1.0
Intermediate-grade occupations	1821	3.3	1775	1.7
Clerks and business employees	3027	5.2	3134	3.4
Manual workers	2549	6.7	2428	5.0
Unemployed (or unknown)	1546	12.1	1375	9.0
Grade repetition				
Never	6966	3.3	8382	1.9
First grade repetition <12 years of age (grade 7)	3380	9.1	2183	8.6
First grade repetition <12 years of age followed by a second	1165	12.6	801	9.9
First grade repetition at age 13–14 years (grades 8–9)	1745	5.1	1477	3.3
First grade repetition at 15–16 years (grades 10–11)	1679	1.9	1615	1.5
No tobacco smoking <16 years of age	10 122	3.2	9954	2.1
Daily tobacco use	4804	10.3	4502	6.6
No lifetime episodes of alcohol use <16 years of age	926	7.0	1145	4.2
Reporting alcohol use without drunkenness	5097	3.8	6731	2.9
Reporting drunkenness	8824	6.0	6517	3.8
No rare drug use <16 years of age	12 454	4.3	12 634	3.1
Use of one rare drug	1271	7.9	931	4.0
Use of two or more rare drugs (excluding the above subgroup)	874	14.5	546	8.5
Cannabis use history				
No lifetime use of cannabis	7788	4.3	8579	3.3
First cannabis use <14 years of age without subsequent daily use	1528	5.7	1228	3.3
First cannabis use <14 years of age with subsequent daily use	837	16.6	360	12.6
First cannabis use at age 15–16 years without subsequent daily use	4217	4.0	4011	2.4
First cannabis use at age 15–16 years with subsequent daily use	565	11.8	280	9.4
No lifetime use of cannabis	7788	4.3	8579	3.3
Lifetime cannabis use without daily use	5745	4.5	5239	2.7
Daily cannabis use <14 years of age	286	18.7	116	21.2
Daily cannabis use by 15–16 years (excluding the above groups)	1116	13.5	524	8.8
Sequences of cannabis use and grade repetition				
Neither grade repetition nor lifetime cannabis use	4000	2.6	5261	1.9
Grade repetition but no lifetime cannabis use	3788	6.3	3270	5.0
No grade repetition but lifetime cannabis use	3121	3.5	3376	2.3
First grade repetition before first cannabis use	2855	9.7	1716	6.9
First grade repetition the same year or after first cannabis use	1161	5.6	829	3.6
Neither grade repetition nor daily cannabis use	6052	2.0	7839	1.4
Grade repetition but no daily cannabis use	7058	5.9	5699	5.1
Daily cannabis use but no grade repetition	375	9.0	227	10.3
First grade repetition before daily cannabis use	888	17.0	333	12.7
First grade repetition the same year or after daily cannabis use	138	9.7	84	8.5

All P -values for χ^2 tests comparing dropouts to students among boys and girls <0.001

(ORa around 2) and the occurrence of grade repetition. For both males and females, repeating a grade <12 years of age was associated with an increased risk of dropping out (ORa = 2.04 for males, ORa = 3.07 for girls), compared with the absence of repetition, with similar results for students who repeated twice. But the link decreased when the age the pupil first repeated was higher: ORa was close to 1 and not significant for the 13–14 age group and significantly <1 for the 15–16 age group.

Compared with lifetime abstinence, experimentation alone (i.e. without subsequent daily use) with cannabis <14 years of age was not linked to school dropout, but experimentation alone at age 15–16 years was associated with school attainment (ORa = 0.80 among boys, 0.64 among girls). In contrast, the progression to daily use was

strongly associated with dropout, especially when following early onset.

The daily consumption of tobacco had a major deleterious impact on dropping out, for males (ORa = 2.62) and females (ORa = 2.92), but experimentation with drunkenness tended to be linked to lower school-dropout rates (ORa was close to significant for lifetime use without drunkenness). Experimentation with rare drugs proved non-significant, except for males, when at least two substances were involved (ORa = 1.97).

Modelling based on both males and females, with gender as a covariate, showed a close to significant interaction between school failure and gender as concerns school dropout ($P = 0.05$), suggesting that the effect of grade repetition tended to be more marked among girls. No interaction was

Table 2 Influence of cannabis experimentation on dropping out of school (ORa and 95% confidence interval)

	Males			Females		
	ORa	95%	CI	ORa	95%	CI
Parents divorced/separated (ref=living together)	2.00	1.71	2.35	1.3	1.33	2.1
SES of the parents: managerial staff	-1-			-1-		
Farmers	1.98	1.20	3.27	1.01	0.41	2.50
Craftsmen and trade workers	2.01	1.43	2.82	2.32	1.44	3.71
Intermediate-grade occupations	1.45	0.99	2.13	1.06	0.59	1.92
Clerks and business employees	1.88	1.36	2.60	2.59	1.67	4.04
Manual workers	2.72	1.97	3.74	3.16	2.02	4.93
Unemployed (or unknown)	4.30	3.10	5.95	4.44	2.81	7.02
Never repeated a school grade	-1-			-1-		
First grade repetition <12 years of age followed by a second one	2.04	1.68	2.48	3.07	2.40	3.92
First grade repetition at age 13–14 years	2.44	1.92	3.11	3.00	2.18	4.14
First grade repetition at age 15–16 years	1.09	0.83	1.43	1.19	0.83	1.70
First grade repetition at age 15–16 years	0.31	0.19	0.51	0.56	0.33	0.93
No lifetime use of cannabis <16 years of age	-1-			-1-		
First cannabis use <14 years of age without subsequent daily use	0.86	0.63	1.16	0.67	0.44	1.02
with subsequent daily use	1.75	1.30	2.36	2.09	1.32	3.32
First cannabis use at age 15–16 years without subsequent daily use	0.80	0.64	1.00	0.64	0.48	0.85
with subsequent daily use	1.37	0.98	1.92	1.40	0.85	2.32
No lifetime use of alcohol <16 years of age	-1-			-1-		
Lifetime alcohol use without drunkenness	0.75	0.54	1.03	0.75	0.53	1.06
At least one episode of alcohol intoxication	0.59	0.42	0.82	0.69	0.47	1.01
No daily tobacco smoking <16 years of age	-1-			-1-		
Daily tobacco smoking	2.62	2.15	3.20	2.92	2.28	3.74
No rare drug use <16 years of age	-1-			-1-		
One rare drug use	1.17	0.90	1.52	1.05	0.71	1.56
Two and more rare drug uses	1.97	1.52	2.55	1.24	0.81	1.91

Significant odds ratios are in bold type; “-1-” stands for the reference category when more than two levels are concerned

found between gender and cannabis experimentation ($P=0.65$).

Progression to daily cannabis use

When focusing on early progression to daily cannabis use (table 3), previous results concerning family related variables, grade repetition, alcohol use, daily tobacco smoking, experimentation with cannabis and rare drug use were confirmed. School dropout was all the more common as the involvement in daily cannabis use was reported early, especially <14 years of age (ORa = 2.05 for boys, ORa = 3.41 for girls), compared with age 15–16 years (ORa = 1.45 for boys, ORa = 1.45 for girls, despite non-significant).

Modelling based on both males and females once again showed a significant interaction between gender and early school failure ($P=0.049$). However, the interaction between gender and the age of progression to daily cannabis use was not significant ($P=0.27$).

Temporal relationship between grade repetition and cannabis use

Grade repetition commonly preceded cannabis use. But the reverse could lead to higher school-dropout rates, as drug use in early adolescence alters cognitive performance and academic achievement. To test this, we carried out additional analyses based on tables 2 and 3, restricted to people who used cannabis and repeated a grade (tables available upon request). Results showed that repeating a grade after experimenting with cannabis significantly decreased the risk of dropping out, compared with the opposite sequence (ORa = 0.48 [0.35–0.66] among males, ORa = 0.50 [0.32–0.79] among females). Similarly, repeating a grade after smoking cannabis on a daily basis tended to decrease the dropout rate compared with the opposite sequence

among boys (ORa = 0.31 [0.14–0.68]) and girls (ORa = 0.43 [0.16–1.17]).

Discussion

Family background and grade repetition

The major factors associated with school dropout are the family's SES, the divorce/separation of the parents and early grade repetition. These results support the findings of prior studies, showing that the family environment predicts the educational strategies of the parents, and that mastering basic skills during the very first school years proves to be the most important predictor for school achievement.^{10–12,15}

Cannabis use and grade repetition

In accordance with hypothesis 1, we found that experimentation with cannabis and daily cannabis use followed the first school failure, as shown by Henry *et al.*,¹⁶ but we discovered that the reverse sequence of events tended to lower school-dropout rates at the age of 17 years (Hypothesis 3). However, generalization to older samples remains problematic, because grade repetition following cannabis use occurred later in school history than the reverse, which mechanically cuts down the dropout rates in the current year, as pointed out above.

Influence of cannabis use patterns

In accordance with hypothesis 2, our major result is that the influence of cannabis use on dropout depends on the patterns of use. Compared with total abstinence, non-daily use of cannabis during school years was a predictor of school attainment at 17 years of age. This result was never reported, even though Ellickson *et al.* found that the association between

Table 3 Influence of the progression to daily cannabis use on school-dropout rates (ORa and 95% confidence interval)

	Boys			Girls		
	ORa	95%	CI	ORa	95%	CI
Parents divorced/separated (ref = living together)	2.00	1.71	2.35	1.63	1.33	2.01
SES of the parents: managerial staff	-1-			-1-		
Farmers	1.97	1.20	3.26	1.02	0.41	2.50
Craftsmen and trade workers	2.00	1.43	2.81	2.29	1.42	3.67
Intermediate-grade occupations	1.45	0.99	2.13	1.05	0.58	1.90
Clerks and business employees	1.88	1.36	2.60	2.59	1.66	4.03
Manual workers	2.71	1.97	3.74	3.14	2.01	4.91
Unemployed (or unknown)	4.29	3.10	5.94	4.40	2.78	6.96
Never repeated a grade	-1-			-1-		
First grade repetition <12 years of age	2.03	1.67	2.46	3.06	2.40	3.92
followed by a second one	2.43	1.90	3.10	3.00	2.18	4.14
First grade repetition at age 13–14 years	1.09	0.83	1.43	1.20	0.84	1.71
First grade repetition at 15–16 years	0.31	0.19	0.51	0.56	0.34	0.94
No lifetime use of cannabis <16 years of age	-1-			-1-		
Lifetime cannabis use without daily use	0.81	0.66	1.00	0.65	0.49	0.85
Daily cannabis use <14 years of age	2.05	1.41	2.99	3.41	1.89	6.13
Daily cannabis use at age 15–16 years	1.45	1.09	1.92	1.45	0.95	2.20
No lifetime use of alcohol <16 years of age	-1-			-1-		
Lifetime alcohol use without drunkenness	0.75	0.54	1.02	0.75	0.53	1.06
At least one lifetime episode of alcohol intoxication	0.59	0.43	0.82	0.69	0.47	1.01
No daily tobacco smoking <16 years of age	-1-			-1-		
Daily tobacco smoking	2.63	2.15	3.20	2.93	2.29	3.75
No rare drug use < 16 years of age	-1-			-1-		
One rare drug use	1.18	0.91	1.53	1.06	0.72	1.57
Two or more rare drug uses	1.99	1.54	2.56	1.20	0.78	1.84

Significant odds ratios are in bold type; “-1-” stands for the reference category when more than two levels are concerned

cannabis and dropping out proved non-significant when controlling a variety of confounding variables in the case of Latino Youths in the USA.²⁵ Admittedly, previous studies suggested that progression to daily consumption has a detrimental effect on school attainment.^{7,26} In our study, early onset use increases dropout rates only when progression to daily consumption is involved. This result has never been reported before.

Positive effects of the onset of alcohol and cannabis use

Experimentation with alcohol and drunkenness during school years enhanced school attainment compared with total abstinence. This result was underlined for Blacks and Asians in the USA.²⁵ Our finding may reflect similar characteristics, as self-reported abstinence is often motivated by cultural or religious beliefs and practices^{27,28} which were not surveyed, but are often linked to poorer social integration. However, drinking among teenagers is very common and can be regarded as an indicator of good peer integration and an ability to mobilize social networks.²⁹ Moreover, there is some evidence proving the integrating effects of extra-curricular activities on school performance, even where drug use is concerned.^{30,31} Similar explanations (despite the fact that cannabis use is less obviously linked to religion) could be valid for some patterns of cannabis use, especially in the French context where experimentation is very common and is rather equally distributed among the SES.¹⁷ Initiation into alcohol, drunkenness and cannabis could then be considered as positive social experiences or ‘rites of passage’,³² as long as they are the norm and not followed by intensive uses.

These results do not mean that these experimenting behaviours should be encouraged to enhance school

performance, but suggest that patterns of use should clearly be distinguished in studies focusing on dropout.

Tobacco and other illicit drug uses

Results for tobacco and illicit drugs other than cannabis were also familiar.⁵ The highly detrimental role of tobacco may be linked to its relationship with depression,³³ which alters cognitive performance. But it may also reflect the deterioration of its image, now perceived as a deviance,³⁴ when its use dramatically diminishes among students:¹⁷ tobacco could be chosen by socially or academically stigmatized adolescents instead of other drugs (e.g. alcohol) to cope with academic difficulties.

Gender-specific results

In accordance with Hypothesis 4, the effects of repeating school grades and using cannabis on a daily basis tended to be stronger among females. Very few studies assess gender differences relating to dropouts and drug use, but our findings are supported by the results of two longitudinal studies.³⁵ These may reflect the gender-specific social roles ascribed to males and females regarding educational expectations and drug-use behaviour. Existing studies show that females perform better at school than males, although they receive less encouragement to pursue higher education degrees.³⁶ Similarly, the use of cannabis is rarer among girls: users may be regarded as fringe groups, and may face more difficult social, family or personal issues.^{37,38} This interpretation is supported by the higher social vulnerability of females treated for their cannabis use.³⁹ Similarly, the positive effects of alcohol use and drunkenness are more marked among boys, because they are more common among them.

Limitations

The survey is cross-sectional, but its sample is large and representative with participation and response rates close to 100%. This can be considered an advantage over longitudinal studies where attrition rates can be >20%, with evidence of differential and at non-random sample loss among the poor^{7,19} and dropouts.⁴⁰ The questionnaire is designed so that it takes about the same time to complete it regardless of substance use patterns, which is an added source of protection as far as confidentiality is concerned. Its restriction to young people aged 17 years limits memory related biases²³ and is very close to the end of compulsory schooling (at age 16 years). The reported events (first experience of grade repetition, experimentation with cannabis and progression to daily use) seemed sufficiently important to be easily and precisely recalled. Indeed, the mean age for cannabis experimentation or progression to daily use is more or less 15 years, with a standard deviation of around 1 year (<2 years before the data collection); additionally, the age the first grade was repeated was deduced based on the grade itself, this being often asked throughout the pupil's school life for administrative purposes. A more accurate precision in dating these events would not be useful for our purpose.

The minimum age for the high school graduation is 17, ensuring that only very few dropouts are graduated. The family's SES, based on the highest occupational category of the parents, was considered stable throughout the pupils' school life; parental separation was considered to have occurred before the end of the compulsory schooling period (age 16 years), which is reasonable given that subjects are aged 17 years.

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Conflicts of interest: None declared.

Key points

- Family structure and SES as well as tobacco and cannabis smoking were known as major risk factors in the dropout process.
- Cannabis use does not trigger academic failure or lead to dropout, but daily use, particularly when occurring <14 years of age, has a detrimental effect on school attainment;
- Drunkenness and cannabis onset, when not followed by daily use, are associated with school attainment.
- Girls are more affected than boys by their family's SES and by cannabis use.

References

- 1 OECD. Education at glance, 2004. Available at: http://www.oecd.org/document/7/0,3343,en_2649_39263238_33712135_1_1_1_1,00.html#annex (accessed July 2009).
- 2 Anonymous. *The cost of dropping out: the economic impact of school leaving*. Melbourne: Business Council of Australia, 2003.
- 3 Hibell B, Guttormsson U, Ahlström S, et al. *The 2007 ESPAD report—substance use among students in 35 European countries*. Stockholm: The Swedish Council for Information on Alcohol and Other Drugs (CAN), 2009.
- 4 EMCDDA. *The state of the drugs problem in Europe. Annual report 2008*. Lisbon: EMCDDA, 2008.
- 5 Townsend L, Flisher AJ, King G. A systematic review of the relationship between high school dropout and substance use. *Clin Child Fam Psychol Rev* 2007;10:295–317.
- 6 Wichstrom L. Alcohol intoxication and school dropout. *Drug Alcohol Rev* 1998;17:413–21.
- 7 Fergusson D, Horwood L, Beautrais A. Cannabis and educational achievement. *Addiction* 2003;98:1681–92.
- 8 Cox RG, Zhang L, Johnson WD, Bender DR. Academic performance and substance use: findings from a state survey of public high school students. *J School Health* 2007;77:109–15.
- 9 Hoffmann JP. The community context of family structure and adolescent drug use. *J Marriage Family* 2002;64:314–30.
- 10 Caldwell GP, Ginther DW. Difference in learning styles of low socioeconomic status for low and high achievers. *Education* 1996;117:141–47.
- 11 Rosenthal BS. Nonschool correlates of dropout: an integrative review of the literature. *Children Youth Ser Rev* 1998;20:413–33.
- 12 Alexander K, Entwistle D, Kabbani NS. The dropout process in life course perspective: early risk factors at home and school. *The Teach College Rec* 2001;103:760–822.
- 13 Pope HG, Jr, Gruber AJ, Hudson JI, et al. Early-onset cannabis use and cognitive deficits: what is the nature of the association? *Drug Alcohol Depend* 2003;69:303–10.
- 14 Fergusson DM, Boden JM, Horwood LJ. The developmental antecedents of illicit drug use: evidence from a 25-year longitudinal study. *Drug Alcohol Depend* 2008;96:165–77.
- 15 Cosnefroy O, Rocher T. Le redoublement au cours de la scolarité obligatoire: Nouvelles analyses, mêmes constats. *Éduc Forma* 2004;70.
- 16 Henry KL, Smith EA, Caldwell LL. Deterioration of academic achievement and marijuana use onset among rural adolescents. *Health Educ Res* 2007;22:372–84.
- 17 Legleye S, Beck F, Spilka S, Le Nézet O. *Drogues à l'adolescence en 2005 – niveaux, contextes d'usage et évolutions à 17 ans en France – résultats de la cinquième enquête nationale escapad*. St Denis: OFDT, 2007.
- 18 Becker HS. *Outsiders: Métaillé, 1985* (New York, The Free Press of Glencoe, 1963).
- 19 Fergusson DM, Horwood LJ. Early onset cannabis use and psychosocial adjustment in young adults. *Addiction* 1997;92:279–96.
- 20 Guxens M, Nebot M, Ariza C. Age and sex differences in factors associated with the onset of cannabis use: a cohort study. *Drug Alcohol Depend* 2007;88:234–43.
- 21 Van Ours JC, Williams J. Why parents worry: initiation into cannabis use by youth and their educational attainment. *J Health Econ* 2009;28:132–42.
- 22 Bless R, Korf D, Riper H, Diemel S. *Improving the comparability of general population surveys on drug use in the European union, final report*. EMCDDA, 1997.
- 23 Beck F, Costes J-M, Legleye S, et al. L'enquête escapad sur les usages de drogues: Un dispositif original de collecte sur un sujet sensible. In: Lavallée P, Rivest L-P, editors. *Méthodes d'enquêtes et sondages pratiques européenne et nord-américaine*. Paris: Dunod, 2006, 56–59.
- 24 Derosières A, Thévenot L. *Les catégories socio-professionnelles*. Paris: La Découverte, 2002.
- 25 Ellickson PL, Dui K, Bell R, Mcguigan K. Does early drug use increase the risk of dropping out of high school? *J Drug Issues* 1998;28:357–80.
- 26 Lynskey MT, Coffey C, Degenhardt L, et al. A longitudinal study of the effects of adolescent cannabis use on high school completion. *Addiction* 2003;98:685–92.
- 27 Legleye S, Beck F, Peretti-Watel P, Chau N. Role of employment or scholar status and gender: Drug use among 18 to 25 year-olds in France in 2005. *Revue d'épidémiologie et de santé publique* 2008;56:345–55.

- 28 Benjet C, Borges G, Medina-Mora ME, et al. Drug use opportunities and the transition to drug use among adolescents from the Mexico city metropolitan area. *Drug Alcohol Depend* 2007;90:128–34.
- 29 Peretti-Watel P, Beck F, Legleye S. Heavy drinking and patterns of sociability at the end of adolescence: a French survey. *Int J Adolesc Med Health* 2006;18:159–69.
- 30 Oetting ER, Donnermeyer JF. Primary socialization theory: the etiology of drug use and deviance. *Int Subst Use Misuse* 1998;33:995–1026.
- 31 Lleras C. Do skills and behaviors in high school matter? The contribution of noncognitive factors in explaining differences in educational attainment and earnings. *Soc Sci Res* 2008;37:888–902.
- 32 Van Gennep A. *Les rites de passage. Étude systématique des rites*. Paris: Picard, 1909.
- 33 Windle M, Windle RC. Depressive symptoms and cigarette smoking among middle adolescents: prospective associations and intrapersonal and interpersonal influences. *J Consult Clin Psychol* 2001;69:215–26.
- 34 Chapman S, Freeman B. Markers of the denormalisation of smoking and the tobacco industry. *Tob Control* 2008;17:25–31.
- 35 Ensminger ME, Lamkin RP, Jacobson N. School leaving: a longitudinal perspective including neighborhood effects. *Child Dev* 1996;67:2400–16.
- 36 Insee. *Men and women: focus on gender differences and roles*. Paris: INSEE, 2008.
- 37 Beck F, Chaker S, Legleye S. *Différences de genre dans les usages de substances psychoactives. Ofdt, 2005 national report (2004 data) to the emcdda by the reitoxo national focal point France new development, trends and in-depth information on selected issues french version*. St Denis: OFDT, 2005, 73–91.
- 38 Emcdda. *A gender perspective on drug use and responding to drug problems*. Lisbon: European Monitoring Center for Drug and Drug Addiction, 2006.
- 39 Obradovic I. *Enquête sur le profil du public des consultations cannabis*. Saint-Denis: OFDT, 2008.
- 40 Crum RM, Ensminger ME, Ro MJ, Mccord J. The association of educational achievement and school dropout with risk of alcoholism: a twenty-five-year prospective study of inner-city children. *J Stud Alcohol* 1998;59:318–26.

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