From cannabis initiation to daily use: educational inequalities in consumption behaviours over three generations in France

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Abstract

Background and aims: The diffusion of cannabis initiation has been accompanied by a reversal in the educational gradient: contrary to older generations, the less educated in recent generations are more likely to initiate than the more educated. We tested whether the educational gradient for the transition from initiation to daily use has evolved in the same way.

Design/setting: A French telephone random survey conducted in 2010 (21,818 respondents aged 15-64), asking interviewees about their ages at initiation and transition to daily use, if any.

Participants: The 6,824 cannabis initiators aged 18-64 years at data collection. Three birth cohort groups (generations) were compared: 1946-1960 (n=767), 1961-1975 (n=2,632) and 1976-1992 (n=3,425) with respectively 47%, 42% and 45% of women.

Measurements: Risks of transition to daily use from ages 11 to 34 were compared through time-discrete logistic regressions and educational gradients were quantified through a relative index of inequality (RII). Control variables include age and time-varying variables (ages at tobacco daily use, at first drunkenness and at first other use of an illicit drug in a list of 13 products).

Findings: 24.0% of the initiators reported daily use before age 35, the proportions tripling from the oldest to the youngest generation (from 11.7% to 38.6% in men, from 7.7% to 22.2% in women). Whatever the generation, the less educated initiators more often shifted to daily use than the most educated: from the oldest to the youngest generation, RII=2.13 95%CI=[0.65; 7.02], 2.19 95%=[1.33; 3.63] and 2.24 95%CI=[1.60; 3.15] in men; RII=3.31 95%CI=[0.75; 14.68], 3.17 95%CI=[1.49; 6.76] and 3.56 95%CI=[2.07; 6.14] in women, respectively.

Conclusion: In France, the risk of transition from cannabis initiation to daily use has remained consistently higher among-less educated cannabis initiators over three generations (1946-60, 1961-75, 1976-92), in contrast to what is observed for initiation**.**

Keywords: daily cannabis use; social gradient; retrospective cohort; France; time-discrete analysis.

Introduction

In Europe, 23.7% of people aged 15-64 report having smoked cannabis in their lifetime while 6.8% report use in the past year (1). Despite being known for centuries, the diffusion of cannabis use at a large scale in the population is relatively recent and not very well described. Most available results concern short-term trends in experimentation or in use over the previous 12 months (http://www.emcdda.europa.eu/stats13), showing a quick rise in prevalence from the early 1990s up to 2005, and stagnation from then on.

Studies show that in most cases, consumption remains experimental or occasional (2). The vast majority of current users are under 34 years old and are concentrated in the less affluent social groups, unemployed, and low educated (3-5). Recently, it has been found that the pattern of cannabis consumption by adolescents largely depends on their social background: not only do adolescents from affluent families experiment or smoke less frequently, but the proportions of regular, intensive or problematic users are also lower in this group than among adolescents from more modest backgrounds (6-8).

However, less is known concerning the diffusion of cannabis in the past generations and especially across socioeconomic strata. Very few countries conducted reliable general population surveys on drug use before 1990 (9), and most of them did not inquire about regular or intensive use. Finding early publications related to the social gradient is difficult, and re-analysing the databases seems almost impossible. The level of use was lower before the 2000s, and the association of experimentation and regular use with socioeconomic position may have been different in earlier times, but this remains unexplored. Some recent studies in the USA (10, 11) and Germany (12) used repeated cross-sectional surveys to model current or past-year use across generations, but they did not assess educational gradients, and neither did they investigate transitions to regular or daily use. Using retrospective data, we showed that there was a shift in the educational gradient associated with experimentation

across three generations in France, USA and Germany (13): the less educated were more often experimenters in the younger generations, whereas the opposite was the case in the older generations. Unfortunately, our study did not consider transition to daily use and the picture of the cannabis epidemic is still incomplete.

Moreover, none of the above-mentioned studies considered the potential effects of other substances. Cannabis use is often started after licit drug use (14-16), but the consumption of other illicit drugs may also increase the risk of future daily cannabis use. As levels of use of these substances have varied in recent decades (17-19), the estimates may be biased by not taking these changes into account. France is one of the countries with the highest prevalences of cannabis use (1): in 2010, 9% of 18- to 25-year-olds were regular users (at least 10 days of use in the last 30 days) (20). Building on our findings related to cannabis experimentation (13), this study aims to further investigate the cannabis epidemic. For this purpose, we use a French survey containing retrospective information on both age at cannabis initiation and transition to daily use, which is quite unique. Our research questions are the following:

- How did the probability of transition from initiation to daily use evolve across generations, and was the pattern similar in men and in women?
- Did the educational gradient of transition to daily use evolve across generations for each gender?
- Was the evolution of educational gradient across generations similar in men and in women?

Method

Data

The 2010 ‘Health Barometer’ was a nationwide French survey that used a two-stage random sampling frame (household/individual) to measure health perceptions and behaviours of the general population (19). Landline and mobile telephone numbers were randomly generated and tested to discard the non-functioning/non-attributed numbers. No geographical stratification was possible. Households were selected by calling the remaining numbers, and one interviewee was then randomly selected in each household (the household is thus considered as a cluster with one individual). During questionnaire administration, the type of equipment (landline/mobile only and number of active telephone numbers) was recorded and used to define the “mobile only” stratum. The final sampling probability takes account of the telephone equipment and number of lines as well as the number of eligible household members. All data collected were anonymous and self-reported. The survey was approved by the French Commission on Individual Data Protection and Public Liberties (the *Commission Nationale Informatique et Libertés (CNIL)*). Unsuccessful calls were repeated after 30 and 90 minutes, with up to 40 attempts being made on different days and at different times. The response rate was 60.5%. Survey weights were obtained through a calibration procedure considering phone type, age, educational level and region of residence. The initial sample comprised 21,818 individuals aged 15-64 years who were asked about their history of cannabis use, among whom 7,162 initiators (persons who had ever used cannabis) were retained for this study.

Measures

Outcome

The outcome was the reported transition to daily cannabis use (0/1) at a given age, based on the following questions: "Did you ever smoke cannabis every day for at least one month?" and, for those answering yes: "How old were you when you smoked cannabis on a daily basis for the first time?". For those who could not give a precise age, 5-year age ranges were proposed: "Was it between age 10 and 15, 15-20…?". Age at cannabis initiation (first use), an important predictor of future daily or dependent use (21), was obtained in the same way.

Cannabis use histories were reconstructed for each subject from age at initiation (minimum 10) up to age at transition to daily use (if it was below 35) or up to current age (if it was below 35 and if no daily use was recorded before age 35, these observations being right-censored). The resulting person-year database had many lines per subject, with outcome coded 0/1. These definitions are the same as those used in our study on experimentation (13) and are based on the fact that almost all users are aged below 35 (2).

Analytical sample

Three birth cohort groups (hereafter named "generations") were compared: 1946-1960, 1961-1975 and 1976-1992 (i.e., people aged 18-34, 35-49 and 50-64 years at the time of data collection). There were very few non-responses. Out of the initial sample of 7,162 cannabis initiators, we discarded 37 who did not report age at initiation and 301 who experimented after age 34. The analytical sample thus includes 6,824 individuals aged 15-64 having initiated cannabis before age 35: 66.9% of the youngest generation was censored (age below 35 without outcome) versus 0% of the intermediate and oldest generations.

Covariates

Educational level is a reliable indicator of social position and a major determinant of many health behaviours, including tobacco smoking (22, 23). We used the categories of the International Standard Classification of Education (ISCED) (24) to define educational attainment (highest diploma ever obtained): low {0, 1, 2} corresponding to lower secondary; medium {3, 4} corresponding to upper or post-secondary; high-short {5} corresponding to the first level of tertiary education; high-long {6 and over} corresponding to the upper level of tertiary education. As tracking the trends in educational gradients requires equivalent measures across generations (25), ridit scores (26-28) were computed, ranking each individual of each gender in each generation. The odds ratio of the ridit is the relative index of inequality (RII): a value over 1 indicates that the least educated have a higher risk than the highest educated.

Covariates were: first transition to tobacco daily use, first drunkenness episode and first use of any of 13 other illicit drugs (OID: hallucinogenic mushrooms, poppers/inhalants, ecstasy/MDMA, amphetamines, LSD, cocaine, crack, heroin, subutex/methadone, GHB/GBL). For all these events, precise ages were asked first, and age ranges were proposed in case of hesitation. Drunkenness was subjectively defined ("Have you ever been drunk?").

As age at cessation of cannabis daily use was not recorded, we could not study the duration of cannabis daily use. To overcome this limitation, we computed the proportions of ever daily users before age 35 who were still current cannabis users in the month before data collection and the number of smoking episodes in that period.

Statistical analysis

Sample characteristics are shown in Table 1. Transition from cannabis initiation to daily use was described for each generation, gender and educational level, using the cumulative

proportions of daily users from age at initiation to 34 years old depicted in Figure 1. Multivariate time-discrete regression, a survival analysis technique that handles right-censoring (29), was used to model daily cannabis use. Three models were run. In addition to the ridit describing the educational gradient, the first stage of modelling considered age at data collection (that differentiates younger and older subjects in each generation), years of follow-up and years of follow-up squared. In addition to the previous covariates, the second stage of modelling integrated age at cannabis initiation. In the third stage, the full models also included tobacco daily use, drunkenness experimentation and OID use as binary time-dependent covariates (set to 0 before age at first event, and set to 1 from this age to the end of observation). We present stratified analyses by gender and generation but also tested interactions to answer our three questions: 1/ equality of the educational gradient by gender was tested in each generation (bivariate interaction gender×ridit); 2/ the evolution of the educational gradient across generations was tested for each gender (bivariate interaction ridit×generation) 3/ the global pattern between these variables was tested with a three-way interaction (gender×ridit×generation). The sampling scheme was taken into account using the weighted data and the "survey" procedures in SAS with second-order Rao-Scott Chi-square tests and linear regressions (however, using unweighted data or ignoring the sampling frame did not meaningfully alter the point estimates and the conclusions, although it led to narrower confidence intervals and potentially more frequent Type I errors). Graphics were produced in Stata 12.

Results

Sample

The sample included 3,425 experimenters aged 18-34, 2,632 aged 35-49 and 767 aged 50-64 (Table 1). In general, the younger generations were characterised by earlier ages at onset and higher levels of substance use, with some exceptions: daily tobacco use declined from the oldest to the youngest generation and drunkenness remained quite stable across generations.

Transition to daily cannabis use

Among initiators, 24% made the transition to daily use before age 35. This proportion increased over the generations (from 10.1% to 31.9%) and in similar proportions for each gender. Transition to daily use was also more frequent in men than in women ($p<0.001$), except in the oldest generation ($p=0.102$), for whom this was true only among the most educated (8.9% vs. 1.6%, $p=0.020$). There was a clear link with educational level: the lower the educational level, the higher the proportion of ever daily users (Figure 1 & Table 2), except in the oldest generation of women.

In the multivariate stratified model 1 (Table 3), the social gradient appears to be roughly the same regardless of the generation: less educated initiators were more prone to become daily users than the others. When controlling for age at initiation (model 2), the RII in men varies between a first non-significant value of 2.13 (95%CI=[0.65-7.02]) in the oldest generation, 2.19 (95%CI=[1.33-3.63]) in the intermediate and 2.24 (95%CI=[1.60-3.15]) in the youngest. For women, the corresponding values are higher: 3.31 (95%CI=[0.75-14.68]), 3.17 (95%CI=[1.49-6.76]) and 3.56 (95%CI=[2.07-6.14]). Comparison of models 1 & 2 shows that controlling for age at initiation has a limited impact. In the full models, significant RIIs are also almost unchanged, except in the youngest generation, for whom they are somewhat lower.

In the full models, bivariate interaction tests also show that: 1/ the RII does not differ significantly by gender (p-value=0.410 in the oldest generation, p-value=0.390 in the intermediate), except in the youngest generation (p-value=0.045), confirming that the RII was more pronounced among women in this generation; 2/ the RII does not vary across generations in men (p-value=0.819) or in women (p-value=0.942). The three-way interaction gender×ridit×generation is not significant (p=0.489), confirming that the global pattern of educational gradient by gender does not vary across generations.

Persistence of cannabis use in the ever daily users

We computed the proportions of ever daily users that were still current cannabis users in the month before the interview and the mean numbers of consumption episodes in this period. We distinguished only two educational groups for sample size issues: low and medium vs. high-short and high-long (Table 4). The proportions of past-month users tend to be higher among the least educated, although this is significant only among men in the youngest generation (50.2% vs. 39.2%, p=0.030), while the mean numbers of uses among past-month users are clearly higher among the least educated (except in women from the middle generation, for whom the difference is opposite but non-significant).

Discussion

Summary of findings

We found that the probability of transition from initiation to daily use increased over generations for both genders in similar proportions, and that in all generations, and for men and women alike, the lower educated were more likely to shift from initiation to daily use and were more often persistent frequent users than the higher educated. These results were mostly unchanged when additional substance uses were introduced into the models.

Cannabis diffusion and risk perception in France

In most European countries including France, cannabis consumption increased rapidly between the 1990s and the early 2000s. In that period, French young people increasingly considered cannabis as a "normal" recreational substance, like alcohol and tobacco, with moderate health risks compared to "harder" illicit substances (30-32). This negative relationship is common to most countries (33, 34). Cannabis started to become a public health concern when the results of the first adolescent survey were published in 2000 (35), immediately followed by the first national prevention campaign "Know more, risk less" (36). Since that date, scientific findings have been regularly disseminated in the media (37-40) and specific treatment centres for young users have been developed (41). In 2009, French people, the most educated especially, judged cannabis more risky than in 2002 (42, 43).

There is indeed a reversal of the educational gradient in initiation across generations; unfortunately, it preceded the first prevention campaigns by many years (13). Further to that, our current findings suggest that cannabis use on a regular basis has been consistently considered dangerous by the most educated categories of the population. What could explain this social pattern?

The innovation-distinction model

In line with the theory of the diffusion of innovation often referred to in the tobacco epidemic (44-46), we may think that the most educated categories of the population who pioneered the cannabis diffusion process, finally tended to abandon cannabis because of its lower distinctive power (47) and because they adopted more healthy behaviours as smoking became denormalised (48). Unfortunately, although the previous results concerning initiation (13) fit within this framework, this is not the case for the transition to daily use: determinants other than public information and level of use have to be found.

Academic and professional expectations

The illegal status of cannabis and its psychotropic effects, including its addictive power (between 20% and 50% of the near-daily users will become dependent (2, 49)) and its potentially deleterious effect on cognitive performance (50), have been known for a long time, although generally not through the scientific literature. These effects are a special concern for people with high academic and professional expectations because addictive behaviours involve a compromise between immediate satisfaction and delayed health or psychosocial problems: people who care more about their future are less likely to engage in cigarette smoking or illicit drug use (51-53). This general framework of time-preference is supported by survey evidence. Moderate cannabis use (a few times per year or per month) is still more frequent among French adolescents from affluent families, while problematic or daily use are concentrated among those from modest backgrounds, as are tobacco and alcohol consumption (7, 54). A qualitative study among adolescents in Paris showed that the controlled pattern of use by socially advantaged adolescents was linked to their projection into the future, namely their attention to current school performance and to their plans for entering higher education. In contrast, adolescents from modest backgrounds, who have lower academic ambitions, did not have such incentives to temper their use (55). Our finding that the lower educated daily cannabis users were more often persistent users is consistent with these interpretations and with the tobacco literature showing that the low educated groups have more difficulties in giving up tobacco smoking (56-58) because they are less motivated to stop smoking for health reasons.

Gender differences

Our study underlines that apart from differences in levels of use, the determinants of cannabis use are very similar among men and women in each generation and over time, as shown by the high p-value of the three-way interaction gender×ridit×generation (p=0.489).

Nevertheless, the RII was more pronounced in women than men in the youngest generation (3.56, 95%CI=[2.07-6.14] vs 2.24, 95%CI=[1.60-3.15], p-value=0.045): this could reflect a more rapid processing of the information on cannabis harm by the most educated women, which may be related to worries about childbearing.

Comparisons with other studies

France is a centralised country characterised by a high level of cannabis consumption and a recent increase in the perception of associated health risks. In the US, the level of use is higher than elsewhere; in this federal country, four states legalised the sale and use of marijuana in 2014 and 23 have legalised its medical use since 2008 (59). Young people's perception of the risk of serious harm associated with a regular use is lower than everywhere else (34, page 335) and it has even decreased in 14 states (60). In the general population, the perception of serious risks from regular use has decreased since 2008, especially among the most educated (61). Legalisation may have had a strong influence on the recent perception of risks but there is no study documenting the long-term educational gradient toward daily use. Our study thus needs to be replicated in other countries.

Limitations

First, this study shares the usual shortcomings of quantitative telephone surveys, including a relatively low participation rate (60.5%). As in epidemiological studies (62, 63), non-participants were probably less educated than participants. Our use of weighted data should have limited this problem and the coverage of the population is excellent (1% of the population was not reachable by phone in 2010 (64)). Second, our measures may be affected by recall biases and differential mortality. Although retrospective measures are considered reliable for cannabis (65, 66), there could be recall problems in the least educated or oldest groups (66). Nevertheless, the subjects were less than 65 years old and living in ordinary dwellings: most of them were still economically active and without memory problems. The

survey excludes those who died before age 65, a group disproportionately composed of smokers and people with low education (67): differential mortality may thus bias the results in the oldest cohort. But limiting the analysis to persons under 65 years of age minimises the problem for tobacco (68) and thus for cannabis and other illicit drugs, as mortality attributable to these substances is much lower (69). Third, the cross-sectional nature of the data makes it hard to disentangle the causal relationships between education and cannabis use as many young people already smoke cannabis before completing their education. Some authors argue that the relationship between schooling and health-related behaviours is not necessarily causal, but instead reflects the influence of time preferences on both outcomes (70, 71): the propensity to plan ahead may contribute to both academic achievement and non-use of cannabis (51-53). Fourth, it is important to note that low educational attainment often coexists with other negative social or psychological factors: these potential confounders often favour cannabis use but were not covered in our survey. Fifth, the number of female cannabis initiators and daily users in the oldest generation is small, and the corresponding results have to be interpreted with caution.

Conclusions

Our study demonstrates that transition from cannabis initiation to regular use has consistently been more likely to occur among the least educated over recent decades. This contrasts with recent findings of a reversal over time of the social gradient for initiation, from higher likelihood of initiation among the most educated to higher likelihood among the least educated. Based on this decomposition of the trajectory of cannabis use, we suggest that the most educated categories have always been less prone to shift from initiation to regular use than the least educated, and that over time they changed their attitude toward cannabis mainly by refraining from initiation. Both phenomena compound to increase educational inequalities in consumption behaviour over time throughout the process leading from abstinence to daily

use. In addition, the least educated are also persistent frequent cannabis users, exposing them to even higher health hazards. These convergent disadvantages suggest that prevention has to focus on initiation and has to target the least educated and more generally the most socially disadvantaged categories of the population.

Table 1: Sample of cannabis experimenters before age 35 by birth cohort group (n=6,824).

	18-34 years	35-49 years	50-64 years	*P*
Total (n)	3,425	2,632	767	
Men (n)	1,882	1,536	407	
Women (n)	1,543	1,096	360	
Ever daily cannabis use before age 35 (n (%))	996 (31.9)	444 (18.4)	72 (10.1)	<.001
Men	678 (38.6)	329 (22.6)	48 (11.7)	<.001
Women	318 (22.2)	115 (11.1)	24 (7.7)	<.001
Education level ISCED (n (%))				<.001
Low	389 (18.9)	295 (20.8)	138 (26.7)	
Medium	1651 (50.6)	1187 (47.3)	237 (33.4)	
High-short	545 (14.2)	416 (14.0)	114 (13.9)	
High-long	840 (16.2)	734 (18.2)	278 (26.1)	
Lifetime daily tobacco use before age 35 (n (%))	2401 (71.7)	2095 (79.6)	760 (80.5)	<.001
Lifetime drunkenness before age 35 (n (%))	2990 (85.7)	2339 (85.3)	790 (81.5)	0.025
Lifetime OID[a] use before age 35 (n (%))	1018 (30.4)	663 (24.0)	174 (16.7)	<.001
Age at daily tobacco use before age 35				
Sample size with valid observations	2,301	1,937	572	
mean (sd)	17.0 (0.06)	18.1 (0.09)	19.1 (0.19)	<.001
median (sd)	16.2 (0.07)	17.3 (0.09)	17.8 (0.16)	
Age at first drunkenness before age 35				
Sample size with valid observations	2,958	2,202	587	
mean (sd)	16.8 (0.06)	18.2 (0.09)	18.7 (0.16)	<.001
median (sd)	16.2 (0.06)	17.3 (0.07)	17.6 (0.15)	
Age at first OID[a] before age 35				
Sample size with valid observations	1,013	646	171	
mean (sd)	19.3 (0.12)	20.3 (0.18)	21.6 (0.35)	<.001
median (sd)	18.2 (0.15)	19.2 (0.23)	18.8 (0.41)	
Age at cannabis experimentation before age 35				
Sample size with valid observations	3,425	2,632	767	
mean (sd)	17.3 (0.05)	19.4 (0.09)	21.3 (0.18)	<.001
median (sd)	16.6 (0.05)	18.0 (0.07)	19.6 (0.25)	
Age at daily cannabis use before age 35				
Sample size with valid observations	996	444	72	
mean (sd)	18.2 (0.10)	20.3 (0.21)	20.1 (0.44)	<.001
median (sd)	17.2 (0.10)	19.2 (0.26)	19.0 (0.49)	

[a]: OID=Other illicit drug than cannabis.

Numbers are not weighted. Weights and complex sampling are taken into account for percentages and tests

P: p-value for second-order Rao-Scott Pearson Chi-square test (categorical variables) or F-test (numeric variables).

sd: standard deviation

Table 2: Proportions of ever daily cannabis users before age 35 among initiators, by educational level, gender and generation

	Men			Women		
	50-64 years old	35-49 years old	18-34 years old	50-64 years old	35-49 years old	18-34 years old
All (n[a] (%))	48/407 (11.7)	329/1536 (22.6)	678/1882 (38.6)	24/360 (7,7)	115/1096 (11.1)	318/1543 (22.2)
By education level (n[a] (%))						
Low	17/94 (18.8)	55/185 (29.1)	112/242 (47.9)	3/43 (8.2)	18/110 (14.9)	51/147 (36.7)
Medium	11/137 (7.2)	173/741 (23.2)	398/988 (40.6)	11/98 (11.2)	61/441 (14.0)	149/663 (22.3)
High-short	8/58 (11.8)	45/226 (20.9)	89/277 (32.7)	6/53 (12.9)	10/189 (4.1)	46/268 (16.9)
High-long	12/115 (8.9)	56/382(13.8)	79/375 (21.3)	4/162 (1.7)	26/350 (7.2)	72/465 (14.7)
p-value[b]	0.076	0.005	0.001	0.154	0.009	0.001

[a]: Number of ever daily users before age 35 / number of experimenters

[b]: p-value for the second-order Rao-Scott Chi-square test for the comparison of the educational categories

Numbers are not weighted. Weights and complex sampling are taken into account for percentages and tests

Table 3: Factors associated with age at daily cannabis use for experimenters before age 35: adjusted odds ratios, time-discrete logistic regressions

	Men			Women		
	OR	LCL	UCL	OR	LCL	UCL
50-64 years old (n[a]=48/407; 24/360)						
Model 1[b]						
Ridit (RII)	3.23	0.91	11.44	3.25	0.69	15.21
Model 2[c]						
Ridit (RII)	2.13	0.65	7.02	3.31	0.75	14.68
Full Model[d]						
Ridit (RII)	1.80	0.61	5.28	5.41	0.86	33.84
Age (increase of 1)	0.95	0.84	1.07	0.90	0.77	1.06
Age at cannabis experimentation	**0.67**	0.58	0.76	0.88	0.76	1.02
Daily tobacco use	**4.37**	1.65	11.53	**3.06**	1.03	9.08
Drunkenness experimentation	1.83	0.67	4.97	0.57	0.16	1.95
OID[e] experimentation	**7.88**	3.75	16.57	**8.96**	3.41	23.51
Years of follow-up	**0.66**	0.45	0.96	0.78	0.48	1.28
Years of follow-up squared	0.98	0.94	1.03	0.99	0.94	1.04
35-49 years-old (n[a]=329/1,536; 115/1,096)						
Simple model 1[b]						
Ridit (RII)	**2.73**	1.67	4.45	**3.38**	1.59	7.17
Simple model 2[c]						
Ridit (RII)	**2.19**	1.33	3.63	**3.17**	1.49	6.76
Full Model[d]						
Ridit (RII)	**1.98**	1.18	3.32	**3.18**	1.45	6.98
Age (increase of 1)	**0.95**	0.92	0.98	1.00	0.95	1.06
Age at cannabis experimentation	**0.80**	0.76	0.86	**0.87**	0.79	0.96
Daily tobacco use	**2.13**	1.55	2.94	**2.98**	1.66	5.34
Drunkenness experimentation	1.11	0.76	1.61	1.49	0.88	2.54
OID[e] experimentation	**3.24**	2.38	4.42	**5.53**	3.38	9.06
Years of follow-up	**0.69**	0.62	0.78	0.66	0.56	0.78
Years of follow-up squared	1.00	0.99	1.01	1.01	0.99	1.02
18-34 years-old (n[a]=678/1,882; 318/1,5430)						
Simple model 1[b]						
Ridit (RII)	**2.94**	2.07	4.18	**4.06**	2.31	7.14
Simple model 2[c]						
Ridit (RII)	**2.24**	1.60	3.15	**3.56**	2.07	6.14
Full Model[d]						
Ridit (RII)	**1.51**	1.03	2.22	**2.69**	1.54	4.69
Age (increase of 1)	**1.03**	1.01	1.05	1.02	0.99	1.05
Age at cannabis experimentation	**0.74**	0.70	0.78	**0.76**	0.70	0.82
Daily tobacco use	**3.29**	2.62	4.14	**2.97**	2.13	4.13
Drunkenness experimentation	**1.86**	1.39	2.48	**1.54**	1.14	2.07
OID[e] experimentation	**2.83**	2.22	3.61	**2.63**	1.86	3.72
Years of follow-up	0.96	0.84	1.10	**0.74**	0.60	0.90
Years of follow-up squared	**0.96**	0.94	0.98	0.99	0.96	1.02

[a]: Number of daily cannabis users / total number of subjects for men (resp. women);
[b]: Adjusted for age, years of follow-up and years of follow-up squared.
[c]: Adjusted with controls cited in [b] plus age at cannabis experimentation.
[d]: Adjusted with controls cited in [c] plus daily tobacco use, drunkenness experimentation, OID experimentation.
[e]: OID=other illicit drug than cannabis (see Methods for the list of the 13 products)
In bold type: significant OR (Wald test p-value<0.05).
The OR associated with the Ridit is the RII.
Weights and complex sampling are taken into account.

Table 4: Proportion of previous month cannabis users among the ever daily users before age 35 and mean number of uses in this period

	35-49 years old	p-value	18-34 years old	p-value
Proportion of past-month users (n[a] (%))				
Men ISCED education level:				
Low-Medium	67/229 (29.0)		242/510 (50.2)	
High-short, High-long	27/101 (26.3)	0.648	68/168 (39.2)	0.029
Women ISCED education level:				
Low-Medium	18/79 (19.1)		68/201 (36.5)	
High-short, High-long	8/36 (23.4)	0.647	34/118 (28.9)	0.273
Number of uses among past-month users (n[b] (mean, sd))				
Men ISCED education level:				
Low-Medium	64 (18.0, 1.98)		237 (19.4, 1.22)	
High-short, High-long	27 (12.3, 1.89)	0.042	66 (11.8, 1.49)	0.001
Women ISCED education level:				
Low-Medium	18 (14.0, 3.54)		66 (25.1, 3.38)	
High-short, High-long	8 (17.1, 4.21)	0.574	33 (10.9, 2.12)	0.001

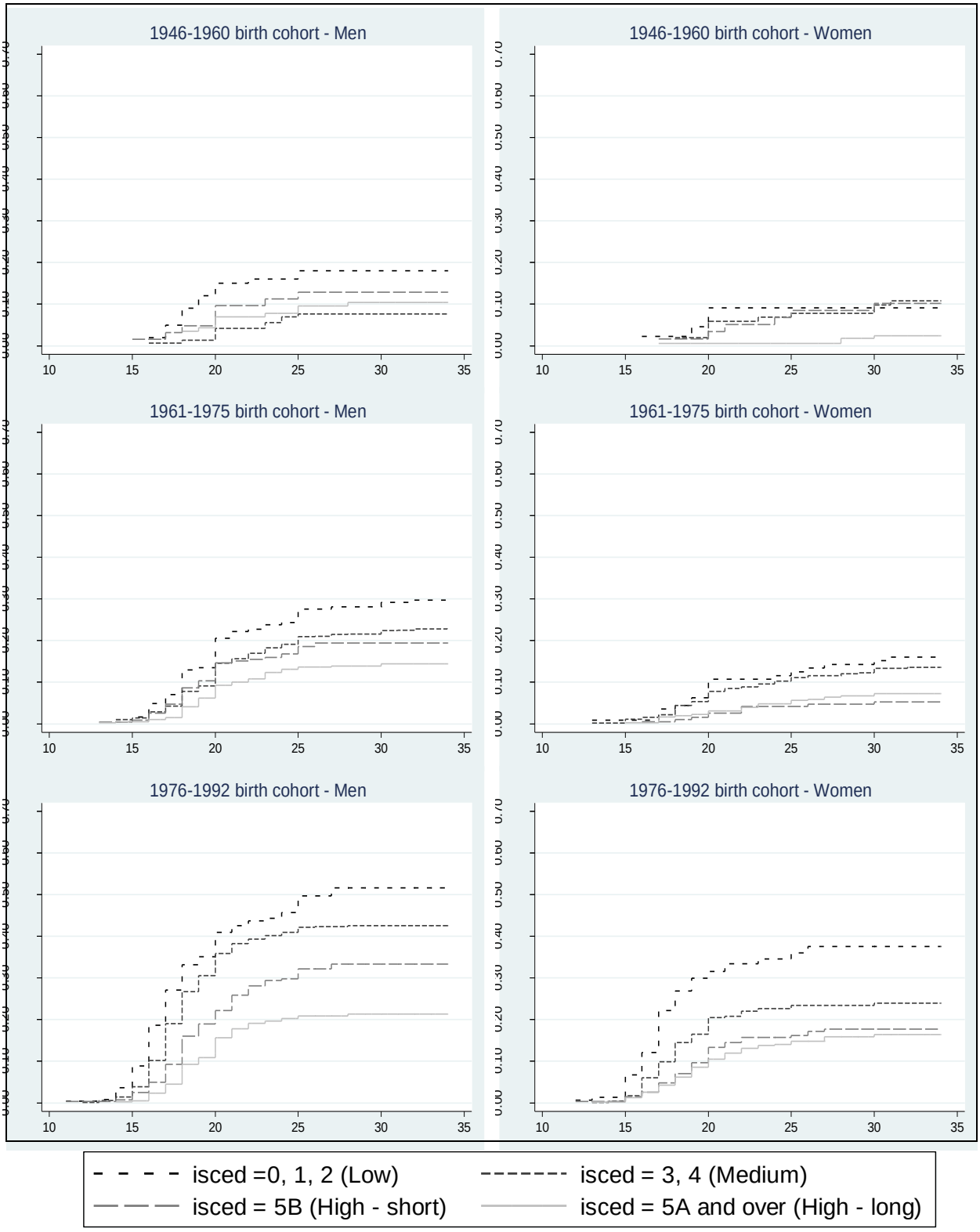
[a]: number of past month users/total number of subjects in the category

[b]: number of past month users with valid number of cannabis uses (no missing value)

P-value: p-value of the second-order Rao-Scott Chi² test (for percentages) or t-test (for means).

Numbers are not weighted. Weights and complex sampling are taken into account for percentages, means and tests

Figure 1: Cumulative proportion of cannabis daily use before age 35 among experimenters (Kaplan-Meier failure function) according to educational status by gender and generation.



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